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Major Daniel S. Roper, U.S. Army

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U.S. Army Command and General Staff College
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The field artillery is challenged to demonstrate that it is both capable of and committed to making those improvements necessary to provide effective support to the heavy maneuver brigade. Units returning from the National Training Center (NTC) frequently report less than anticipated results from the artillery and the entire fire support system. Both maneuver and artillery units are frustrated by this less than expected performance coupled with the knowledge that an inordinate amount of effort was expended in trying to make it work, both at home station and at the NTC. A common thread in NTC reports is the lack of synchronization of fires with the maneuver plan. This thesis investigates the question, "How can field artillery cannon battalions improve field artillery support to the heavy brigade?" It focuses on M109-series, 155mm howitzer battalions in CONUS, with a direct support mission to a heavy brigade combat team during an NTC rotation. It keys on the doctrinal and training aspects of artillery support, primarily the seven basic tasks of the artillery battalion and the principles of training. In particular, it focuses on the challenges of synchronizing artillery with maneuver in the planning phase of an operation through wargaming.

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IMPROVEMENT OF FIELD ARTILLERY SUPPORT TO THE HEAVY BRIGADE

A thesis presented to the Faculty of the U.S. Army Command and General Staff College in partial fulfillment of the requirements for the degree

MASTER OF MILITARY ART AND SCIENCE

by

DANIEL S. ROPER, MAJ, USA
B.S., UNITED STATES MILITARY ACADEMY, 1982
M.S., NAVAL POSTGRADUATE SCHOOL, 1992

Fort Leavenworth, Kansas
1996

MASTER OF MILITARY ART AND SCIENCE

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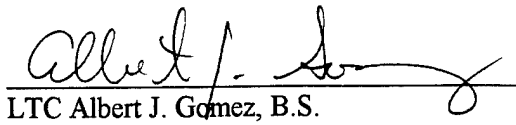
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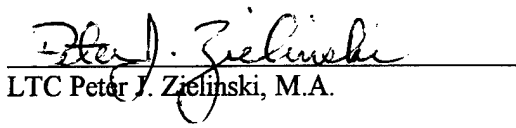
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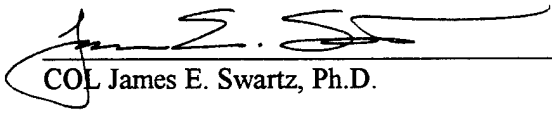
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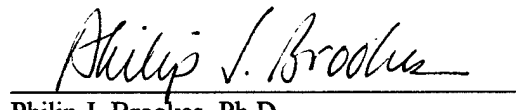
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ABSTRACT

IMPROVEMENT OF FIELD ARTILLERY SUPPORT TO THE HEAVY BRIGADE by MAJ Daniel S. Roper, USA, 90 pages.

The field artillery is challenged to demonstrate that it is both capable of and committed to making those improvements necessary to provide effective support to the heavy maneuver brigade. Units returning from the National Training Center (NTC) frequently report less than anticipated results from the artillery and the entire fire support system. Both maneuver and artillery units are frustrated by this less than expected performance coupled with the knowledge that an inordinate amount of effort was expended in trying to make it work, both at home station and at the NTC.

A common thread in NTC reports is the lack of synchronization of fires with maneuver. This thesis investigates the question, "How can field artillery cannon battalions improve field artillery support to the heavy brigade?" It focuses on M109-series, 155 millimeter howitzer battalions in the Continental United States, with a direct support mission to a heavy brigade combat team during an NTC rotation. It keys on the doctrinal and training aspects of artillery support, primarily the seven basic tasks of the artillery battalion and the principles of training. In particular, it focuses on the challenges of synchronizing artillery with maneuver in the planning phase of an operation through wargaming.

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LIST OF ACRONYMS

BCT	Brigade Combat Team
BOS	Battlefield Operating System
CALL	Center For Army Lessons Learned
COA	Course Of Action
CTC	Combat Training Center
D3A	Decide-Detect-Deliver-Assess
DS	Direct Support
EXEVAL	External Evaluation
FA	Field Artillery
FASP	Field Artillery Support Plan
FDO	Fire Direction Officer
FSCOORD	Fire Support Coordinator
FSO	Fire Support Officer
METL	Mission Essential Task List
MILES	Multiple Integrated Laser Engagement System And
MTP	Mission Training Plan
NTC	National Training Center
OPD	Officer Professional Development
SAWE	Simulated Area Weapons Effects

SEAD	Suppression Of Enemy Air Defense
S-3	Operations Officer
TACSOP	Tactical Standing Operating Procedure
TDMP	Tactical Decision-Making Process
THP	Take Home Package
TOC	Tactical Operation Center
TTP	Tactics, Techniques, And Procedures
XO	Executive Officer

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CHAPTER 1

INTRODUCTION

Field Artillery Support Shortcomings Observed at the National Training Center

> Field Artillery is exceptionally good at sending rounds downrange and hitting the right point on the ground. The piece we don't do well is to put rounds on a specific target at exactly the right time and event in the battle.[1]
>
> Brigadier General William G. Carter,
> Commanding General, NTC, Field Artillery Journal

Background

"The mission of the field artillery is to destroy, neutralize, or suppress the enemy by cannon, rocket, and missile fire and to help integrate all fire support assets into combined arms operations."[2] The maneuver brigade commander relies upon his direct support field artillery (FA) battalion commander to accomplish this mission for him in support of the brigade combat team (BCT). In spite of the best efforts of the field artillery and maneuver communities, consistently successful accomplishment of this mission has proven to be an elusive goal.

The field artillery is faced with a continuing challenge to demonstrate that it is both capable of and committed to making those improvements that will ensure that it will provide effective support to the heavy maneuver brigade. Units returning from the National Training Center (NTC) frequently report less than anticipated results from the field artillery and the entire fire support system. Both maneuver and artillery units are frustrated from the combination of a less-than-expected performance by this essential battlefield operating system (BOS) and the knowledge that an inordinate amount of effort and energy was expended in trying to make it work,

both at home station prior to deployment and at the NTC where they tried to execute it. Among the myriad explanations for this disparity are personnel turbulence, inadequate collective training at home station, inexperienced personnel in key positions, and a lack of understanding by maneuver leaders on how to employ their fire support assets. A common thread in reports and observations from the NTC is the lack of synchronization of fires with the execution of the maneuver plan. This lack of progress has been well documented by observer controllers (OCs) at all of the Combat Training Centers (CTCs), the staff of the Center for Army Lessons Learned (CALL), and scores of officers who have experienced this frustration at the CTCs and have shared their experiences in professional journals.

The Research Question

This thesis will investigate the question: "How can field artillery cannon battalions improve field artillery support to the heavy brigade?" Fundamental to this study is an understanding that this is not an issue that can be resolved exclusively by field artillerymen. The maneuver commander is responsible for the effectiveness of his fire support system. His fire support coordinator (FSCOORD), the direct support (DS) field artillery battalion commander for the maneuver brigade, is responsible for coordinating his fire support, but it remains the maneuver commander's system. The field artillery community, as the principal fire support provider to the maneuver brigade commander, should take the lead in the identification of obstacles to and recommendations for potential solutions to this problem.

This thesis will attempt to explain why NTC results repeatedly show that field artillery support effects are not commensurate with efforts and resources expended by fire supporters. It will seek answers to the following questions in order to fully address this topic: "How can field artillery cannon battalions improve field artillery support effectiveness at the NTC?" Which elements of doctrine, organization, training, materiel, and leadership (DOTML) may be particularly relevant to this subject? What is synchronization? How are fires synchronized with

the maneuver plan? Does "lack of synchronization" necessarily result in "less than expected performance?" What are "successful" units doing differently, both at home station and at the NTC? Is there a problem with doctrine, the evaluated units, NTC evaluation criteria, or are the current results as good as can be expected? Do NTC results indicate that field artillery support lessons previously learned and verified at the NTC have been incorporated by units during their rotation and is the Take-Home Package (THP) of value in this process? What can the FA battalion battle staff do to influence this problem? What is the role of the field artillery battalion executive officer (Bn XO), field artillery battalion operations officer (Bn S-3), and the Brigade Fire Support Officer (Bde FSO)? What training imperatives are placed on units to successfully implement field artillery support in accordance with doctrine? Is there a disparity between effective field artillery support and effective field artillery support at the NTC?

Impact of Problem

The fire support community needs to address and rectify this problem now because it will be challenged with a more divergent array of missions in the future. Increasing joint and combined operations will make the artillery support mission even more difficult. Maneuver and field artillery commanders alike will need to ensure that they have a firm mastery of fire support in combined arms operations so that they may better synchronize their efforts in support of joint and combined commanders. If the field artillery, as the maneuver commander's principal fire support agency, cannot consistently provide the maneuver commander the level of fire support that he requires and expects, then the field artillery and the entire fire support community risk losing their relevance to the warfight. Since units will fight as they are trained, it is imperative that they train realistically and deduce the proper lessons from their training. It is essential that artillery and maneuver leaders both understand the true capabilities and limitations of the artillery in order that they may train to maximize the potential effects of the field artillery system. It is critical that maneuver commanders do not leave the NTC with an inaccurate perception of the fire support system's actual capabilities

and limitations, because if they do, they may not attain a true understanding until their soldiers pay an unnecessarily high price on the next battlefield.

Improving field artillery support will become an increasing challenge as resources become more scarce; simply stated, it will be necessary to train smarter, not harder, and leverage the maximum training value out of every opportunity. This is particularly relevant as the U.S. Army mechanized field artillery is transitioning to the M109A6 Paladin Howitzer and Advanced Field Artillery Tactical Data System (AFATDS). While the field will gain technologically superior weapon and fire support systems, the field artillery needs to ensure that their capabilities can readily be translated into better fire support effects. Otherwise, the impact of these technological advances may be less than intended due to inadequate doctrine or less than optimal training.

This study will focus on the improvement of field artillery support and will make extensive use of the results and observations from unit rotations to the NTC. This provides a degree of consistency regarding the conditions under which units perform. It is important to emphasize that the NTC's purpose is not to test, but to train. While an NTC rotation is a significant event in which units will do their very best to succeed, more importantly, it serves as the premier collective training event on the BCT's training calendar. Since the NTC comes closer to replicating combat conditions for the heavy BCT than any other training event, a unit "training up" for a rotation is also improving its ability to successfully perform its wartime mission. This justifies the significant energy expended in the ongoing efforts to improve unit performance at all CTCs. Units may have different criteria for what constitutes a "successful" rotation. Some may focus on quantitative parameters (e.g., number of rounds of killer munitions achieving effects on target, ammunition expenditure, and avoidance of firing incidents); some on mission-related parameters (e.g., number of the BCT's successful missions); and others keying on steady improvement and not repeating errors throughout the course of the rotation. An NTC rotation should not be approached as a "win/lose" event because any unit that makes improvements in its level of training is using the training center for its intended purpose.

Key Terms and Definitions

Battle Staff. The organic (brigade or battalion) primary staff, plus task-organized (CS and CSS) unit leaders constitutes the brigade battle staff.[3]

Close Support Fires. Close support fires are those fires used to engage enemy troops, weapons, or positions that threaten or can threaten friendly forces. Close support fires allow the commander to rapidly multiply the effects of combat power and shift fires quickly about the battlefield. They expand the depth of the battlefield, erode enemy forces, and inflict damage beyond the range of direct fire weapon systems.[4]

Critical Field Artillery Task (CFAT). A critical field artillery task (CFAT) is a task assigned to a field artillery unit, normally a firing battery, that is critical to the accomplishment of a particular mission specified in terms of the task, its purpose, the method for accomplishing the task, and the endstate that accomplishment of the task should produce.[5]

Critical Fire Support Task (CFST). A critical fire support task (CFST) is a fire support task assigned to a field artillery unit, normally the direct support battalion, that is critical to the accomplishment of a particular mission specified in terms of the task, its purpose, the method for accomplishing the task, and the endstate that accomplishment of the task should produce.[6]

CTC Program. The CTC program provides hands on training to combined arms task forces in an environment that replicates combat to the maximum possible degree in peacetime. Brigade and battalion task forces fight against a very competent OPFOR under all conditions, day and night, and are evaluated in live fire and force-on-force. To be successful at a CTC, units must perform their mission essential task list (METL) tasks to mission training plan (MTP) standards. The four combat training centers are the NTC, Joint Readiness Training Center (JRTC), Combat Maneuver Training Center (CMTC), and the Battle Command Training Program (BCTP).[7]

Direct Support (DS). A field artillery battalion with a tactical mission of direct support to a maneuver brigade is primarily concerned with the field artillery and fire support needs of only that brigade. The DS battalion commander positions his unit where it can best support the

supported brigade's scheme of maneuver. A habitual relationship should exist between supporting and supported units in order to facilitate coordination and training. Direct support is the most decentralized standard tactical mission assigned to field artillery cannon battalions.[8]

Field Artillery Support. (See "close support fires").

Firepower. Firepower is produced by all weapons and attack systems available to the force commander. Many of these weapons and attack systems, with the exception of direct-fire weapons, are in the category of fire support, which constitutes a major source of firepower.[9]

Fire Support. Fire support is the collective and coordinated use of indirect-fire weapons, armed aircraft, and other lethal and nonlethal means in support of a battle plan. Fire support includes mortars, field artillery, naval gunfire, air defense artillery in secondary mission, and air-delivered weapons. Nonlethal means are electronic warfare (EW) capabilities of military intelligence organizations, illumination, and smoke. The force commander employs these means to support his scheme of maneuver, to mass firepower, and to delay, disrupt, or destroy enemy forces in depth. Fire support planning and coordination exist at all echelons of maneuver. Fire support destroys, neutralizes, and suppresses enemy weapons, enemy formations or facilities, and fires from the enemy rear area.[10]

Fire Support Coordination. Fire support coordination is the planning and executing of fire so that targets are adequately covered by a suitable weapon or group of weapons.[11]

Fire Support Coordinator (FSCOORD). The direct support field artillery battalion commander is the FSCOORD for the maneuver brigade commander. He is the brigade commander's primary advisor for fire support and is responsible both for the delivery of artillery fires and the coordination for all fire support to the maneuver brigade which he controls through the fire support element.

Fire Support System. Fire support is the product of a system consisting of three parts: fire support command, control, and coordination (C3) facilities and personnel; target acquisition and battlefield surveillance; and fire support resources (weapons).[12]

Maneuver. Maneuver is the movement of forces in relation to the enemy to secure or retain positional advantage. It is the dynamic element of combat--the means of concentrating forces at the critical point to achieve the surprise, psychological shock, physical momentum, and moral dominance which enable smaller forces to defeat larger ones.[13]

Mission Essential Task List (METL). A unit's METL is a compilation of those mission essential tasks that it must successfully perform if it is to accomplish its wartime mission.[14]

Synchronization. The ability to focus resources and activities in time and space to produce maximum relative combat power at the decisive point.[15]

Tactical Decision-Making Process (TDMP). A systematic approach used by commanders and staffs of tactical units to make decisions. It involves identification of the mission, development of courses of action for accomplishing the mission, evaluation of the courses of action, and the communication of the decision to subordinates.[16]

Assumptions

This investigation is predicated upon the following assumptions:

1. That "less than expected performance" of the field artillery component of the fire support BOS can be attributed, at least in part, to "lack of synchronization."
2. That successful units train differently or better at home station than less successful units.
3. That observations, lessons, and results from other than field artillery battalion NTC rotations may be relevant to this study.
4. That while organizational, materiel, and leadership factors likely have some bearing on the problem, their influence does not obviate the utility of isolating on doctrine and training factors.
5. That maneuver commanders potentially may be both part of the problem and part of the solution.

Limitations and Delimitations

The major limitation in attacking the problem of field artillery support is that it is not practicable to isolate any one factor exclusively since the system has so many moving parts. Compounding this difficulty is the challenge of deducing conclusions from the study of an issue that is comprised of both art and science. A limitation of this study is that time will not be available to test the thesis results by providing corrective actions and recommendations to units prior to an NTC rotation and examining their results to determine if this input caused a change in their performance. (An underlying assumption would be that a unit would be willing to accept the results of an external source and implement its recommendations in its training program.) Additionally, due to the significant turnover of personnel in key positions that routinely occurs after an NTC rotation, it may be difficult to determine the scope and quality of training that units conducted at home station prior to their deployments. An additional limitation is the challenge of extrapolating pertinent observations, lessons, and results from other than field artillery battalion NTC rotations with confidence in their relevance. A final limitation is the fidelity with which any study may interpret the results of an artificial training event to reflect the true degree of support that a unit could be expected to provide in combat.

This study will focus on the performance of Continental United States (CONUS)-based M109 series 155 millimeter (mm) Self-Propelled Howitzer field artillery cannon battalions at the NTC from 1995 to 1996. The only battalions considered will be those that had a mission of direct support to a heavy maneuver brigade. While the focus will be on the cannon battalion, there also will be a significant examination of the supported maneuver unit, the brigade combat team (BCT), since the ultimate test of the fire support system is how well it supports the execution of the maneuver commander's plan. The focal points of analysis will be doctrine and training. These points are from the DOTLM (doctrine, organization, training, leadership, and materiel) model used by TRADOC. (TRADOC developed this model to provide a tool that would assist in the collection, analysis, and dissemination of combat relevant lessons from major training events such

as CTC rotations.[17]) Synchronization in the planning phase (vice preparation or execution phases) will be the main doctrinal thread of continuity since effective planning is "the best way to assure synchronization in execution."[18] The principles of training established in FM 25-100, Training the Force, provide the primary training linkage. The thesis will only examine unit training; it will not investigate artillery or maneuver institutional training on this subject, nor will it look at individual self-development training. The seven basic tasks of the field artillery battalion (coordinate fire support, acquire targets, deliver field artillery fires, communicate, move, maintain and resupply, and survive)[19] as established in FM 6-20-1, The Field Artillery Cannon Battalion, will provide a benchmark for evaluation of doctrinal considerations.

Research Approach

This thesis will examine results from field artillery battalion NTC rotations to identify and review recurring trends in field artillery support to the maneuver brigade. It will discuss the NTC evaluation system and criteria for field artillery success. This thesis will investigate the issue of improvement of field artillery cannon battalion support by, (1) describing current U.S. Army fire support and field artillery systems, (2) describing the level of support that the DS field artillery battalion should be able to provide (its desired endstate), (3) assessing the level of support the field artillery battalion has demonstrated that it is able to provide, primarily as documented by results at the NTC (current capabilities), (4) determining what doctrinal and training shortfalls have inhibited progress toward this endstate (obstacles to success and inherent limitations), (5) identifying what has worked well and why (proven techniques), and (6) identifying how more units can progress toward the desired endstate (recommendations for success). It will examine unit take home packages to focus on areas of key interest for the rotating units and will study NTC reports from CALL and the Combat Training Center Warrior Information Network (CTCWIN) to explain why certain shortcomings are observed in many units. A review of articles in numerous professional journals addressing unit CTC rotation performance will also comprise an element of this research.

Anticipated Outcomes

This study will attempt to determine the relationship between field artillery support doctrine and its associated training challenges that impact upon the effectiveness of the support that the direct support cannon battalion provides to the maneuver brigade. After assessing the implications of these doctrinal and training challenges, this thesis will propose methods for artillery units to improve their level of support. This should also assist units in performing their mission at the NTC. It will assess how home-station training influences the quality, timeliness, and relevance of TDMP products which in turn affect artillery synchronization with maneuver. Recommendations for improvement may be forwarded to the Field Artillery School and to field artillery units in the field. This examination may identify problems with artillery doctrine, field artillery synchronization, NTC evaluation criteria, NTC evaluation methods, or may determine that there actually is not a problem. This study may generate tools that may be useful for maneuver or artillery commanders, such as checklists or considerations that assist them in synchronizing fire support with maneuver. The study will also attempt to establish or verify training lessons that may be applicable to other than field artillery units. Discovering new truths or principles regarding field artillery support may not be necessary, or perhaps not even possible. Lastly, confirmation, focus, and reemphasis on what remains most important amid the massive literature on this subject may be its most significant contribution. The final chapter will serve as a stand-alone document that is usable to units in the field in providing guidance for the development and implementation of home station training plans that improve the BCT's ability to integrate its fires and maneuver.

Endnotes

[1]BG William G. Carter, "Synchronizing Combat Power at the NTC, Field Artillery Journal (August, 1992), 5-9.

[2]U.S. Army, FM 6-20, Fire Support in the AirLand Battle (Washington, DC: Government Printing Office, 1988), 2-8.

[3]U.S. Army, FM 25-101, Battle Focused Training (Washington, DC: Government Printing Office, 1990), Glossary 2.

[4]FM 6-20, 2-8.

[5]National Training Center, "Fighting with Fires" (Fort Leavenworth, KS: Center for Army Lessons Learned, May 1995), 3.

[6]Ibid.

[7]FM 25-101, D-2.

[8]FM 6-20, 2-9.

[9]Ibid.

[10]FM 6-20, 1-2.

[11]U.S. Department of Defense, Joint Publication 1-02, Department of Defense Dictionary of Military and Associated Terms (Washington, DC: Government Printing Office, 1994), 146.

[12]FM 6-20, 1-2.

[13]Ibid.

[14]U.S. Army, FM 25-100, Training the Force (Washington, DC: Government Printing Office, 1989), Glossary 5.

[15]U.S. Army, FM 100-5, Operations, (Washington, DC: Government Printing Office, 1993), Glossary-8.

[16]U.S. Army Command and General Staff College, ST 101-5, Command and Staff Decision Processes, (Fort Leavenworth, KS: U.S. Army Command and General Staff College, 1995), 1-2 through 1-9.

[17]U.S. Army, AR 11-33, Army Lessons Learned Program: System Development and Application, (Washington, DC: Government Printing Office, 1989), 3.

[18]FM 100-5, 35.

[19]U.S. Army, FM 6-20-1, Field Artillery Cannon Battalion (Washington, DC: Government Printing Office, 1990), 1-1.

CHAPTER 2

LITERATURE REVIEW

> Fools say they that they learn by experience; I prefer to profit by others' experience.[1]
>
> Otto von Bismarck, Strategy

Introduction

A review of the literature associated with field artillery support and the combat training centers indicates that maneuver and artillery units often report less than satisfactory results from the field artillery component of the fire support system. A common pattern in the literature appears to be that synchronization of field artillery and maneuver plans is inconsistent and in need of improvement. Although integration of fires with maneuver has improved at the training centers since they were established beginning in the mid-1980s, the literature indicates that many shortcomings are repeatedly observed, and that progress has come at a frustratingly slow pace. Much effort has revolved around improvement of performance at the NTC but the work is not yet finished.

A significant amount of work has been done in the fields of field artillery support and fire support synchronization. This work comes from several sources: U.S. Army doctrinal publications, NTC evaluation reports and data, CALL analysis of CTC trends, academic studies, and the accounts of soldiers with NTC experience as relayed through articles in various professional journals. While much of the literature discusses problems in field artillery and fire support synchronization, this discussion has not been sufficient to fix the problem as evidenced by the continued lack of consistently effective fire support at the NTC as evaluated by OCs and reported by participants.

Books

In 1994, a team from the U.S. Army Research Institute for the Behavioral and Social Sciences published Determinants of Effective Unit Performance which employed a variety of techniques to measure and understand unit collective performance both at home stations and at CTCs. The authors conducted an in-depth investigation of seven NTC rotations. This book went into great detail on units' application of the FM 25-100, Training the Force, training management cycle, application of training principles, and the role of battle staff training and synchronization to the integration of critical combat functions. It also identified training and personnel factors that distinguished high performing units from others.[1] Of interest to this thesis, the study found some disconnects between the NTC's BOS and mission-oriented evaluation criteria and units' ability to replicate applicable conditions at home-station, thereby creating a challenge for commanders'.[2] The authors also found that the most successful units did not stand out from the others in any particular area but in the fact that, across the board, their training was more in keeping with the principles of training established in FM 25-100, Training the Force. This suggested that "there is no one thing that a unit can do that will by itself guarantee the effectiveness of its training. Instead, a disciplined application of the principles is necessary to ensure the successful preparation of the unit for combat."[3]

U.S. Army Doctrinal Publications

FM 100-5, Operations, is the Army's capstone doctrinal manual. It provides a comprehensive overview of the range of operations in which the Army could be called upon to perform and the fundamentals for success in all environments. Of particular relevance to this study, it discusses fundamentals of Army operations to include synchronization, combat power, the battlefield operating systems (BOS), and the roles of the different branches.[4] Published in June, 1993, this version of FM 100-5 is newer than any of the doctrinal manuals used in this study. These manuals had been written in support of the 1986 FM 100-5, so there may exist some

disconnects between the capstone doctrinal manual and the branch doctrinal manuals that are subordinate to it.

FM 6-20, Fire Support in the AirLand Battle, is the Army's capstone manual for fire support. It establishes the principles of fire support and describes the components, functions, and required products of the fire support system. It establishes the essential elements of fire support planning and coordination to include fire support estimates and plans. These are the systems which are established to synchronize the fire support system with maneuver.[5]

FM 6-20-1, The Field Artillery Cannon Battalion, focuses on how the field artillery cannon battalion operates. It sets forth doctrine on field artillery organization, command and control, operations, and tactics, techniques, and procedures (TTP). It establishes responsibilities and duties of key field artillery personnel and discusses some aspects of how the FA fights. It describes how the cannon battalion operates in support of the combined arms team, focusing on the battalion with the mission of direct support to a maneuver brigade.[6] It is the principal reference used by the cannon battalion to apply its resources to the BCT warfight. Most significantly to this study, it establishes the seven basic tasks of the field artillery battalion which it must perform successfully in order to accomplish its mission.

FM 6-20-40, Fire Support for Brigade Operations (Heavy), describes maneuver techniques and fire support considerations at brigade level and below. It goes into significant detail on tactics, techniques, and procedures of fire support planning and coordination. It establishes formats for fire support documents such as the fire support plan and the field artillery support plan.[7] It is the reference used by the FSCOORD and the brigade FSO to integrate fire support resources with the rest of the BCT warfight.

FM 25-100, Training the Force, establishes the Army's standardized training doctrine. It provides the guidelines on how to plan, execute, and assess training at all levels, however it is primarily focused on battalion-sized units and higher. It establishes the U.S. Army's principles of training: train as combined arms and services team, train as you fight, use appropriate doctrine, use

performance oriented training, train to challenge, train to sustain proficiency, train using multiechelon techniques, train to maintain, and make commanders the primary trainers; and discusses how they relate to well-trained, combat ready units.[8] This thesis will use these principles as considerations when evaluating units' home-station preparation for an NTC rotation.

FM 25-101, Battle Focused Training, applies the training doctrine established in FM 25-100 and assists leaders at battalion-level and below in the development and execution of their training programs. Of particular relevance to this thesis is its discussion on the use of major training events such as combat training center rotations to maintain battle focus. It provides an overview of the CTC program, offers recommended solutions to problems frequently observed at the CTCs, and offers specific training considerations by BOS, and discusses the CTC training management interface.[9]

FM 71-3, Armored and Mechanized Infantry Brigade, describes how the heavy brigade fights. It focuses on the organizational structure, command and control, tactical employment, combat support and combat service support of the brigade combat team. It outlines the synchronization of the assets that comprise or support the BCT. It describes how the fire support system supports the brigade.

FM 71-123, Tactics and Techniques for Combined Arms Heavy Forces: Armored Brigade, Battalion/Task Force, and Company/Team, supplements the basic FM 71-series doctrinal manuals. It breaks down missions executed at the maneuver brigade level into their basic elements. It addresses troop leading procedures and analyzes tactics and techniques unique to each BOS throughout planning, preparation, and execution phases of an operation. This manual serves as a guide to units in determining effective methods to implement doctrinal concepts.

FM 6-71, Fire Support Handbook for the Maneuver Commander, presents key information on fire support to the maneuver combined arms battalion or brigade commander. It shows the maneuver commander how to best use his fire support assets to confuse, frustrate, and defeat a numerically superior enemy. It describes the duties of fire support personnel, and provides

information on weapon characteristics, munitions, and fire support employment considerations to help the maneuver commander synchronize the fire support BOS with his scheme of maneuver.[10] It is likely the reference most used by maneuver commanders to develop an understanding of the fire support system and fire support synchronization.

Periodicals, Monographs, and Theses

A 1989 U.S. Army Command and General Staff College (CGSC) monograph by Michael J. Bradley entitled "Field Artillery Doctrine: Does It Support Maneuver Warfare?" examined the relationship of U.S. field artillery doctrine to the concept of maneuver warfare. The impetus for this work was the generally poor results of fire support at the NTC. The purpose was to determine what, if anything, was wrong with FA doctrine. The analysis began with an examination of the relative combat power model which relates the combat elements of maneuver, firepower, protection, and leadership. This model was the backdrop for the remainder of the study which looked at the Army's experience at the NTC, the Arab-Israeli wars of the last twenty years, and evolving artillery doctrine. The study concluded that the maneuver and fire support communities were at odds over the adequacy of artillery doctrine due to a shared misconception of the relationship between maneuver, firepower, and protection. Bradley contended that both communities failed to recognize that the elements of combat power are, at times, at odds with each other.[11] His work is of value to investigation in its analysis of the synchronization of the elements of combat power.

A 1992 CGSC thesis by Ray D. Hendrickson III entitled "Fire Support Planning Doctrine And The Decision Making Process," provided a comprehensive look at how well fire support planning doctrine was integrated into the tactical decision making process. It examined whether or not fire support planning can be doctrinally accomplished at the corps to brigade levels. The thesis also discussed current trends in fire support planning as revealed by Operation Desert Storm. He found that fire support doctrine was incongruous since fire support doctrine and the decision making process had developed independently. He concluded that it was left to the fire supporter to

merge these two independent processes into a coherent fire support plan.[12] His work is useful in the analysis of the tools and processes used to synchronize fires with maneuver, in particular with his observation that FM 6-20-1 does not adequately discuss how to integrate the field artillery support plan with the fire support plan.[13]

In a 1995 CGSC monograph, "Challenging The Heavy Brigade Direct Support Artillery Paradigm For The Brigade Close Fight," Allen W. Batschelet examined the success of the current heavy brigade fire support system in the facilitation of the integration of close support indirect fires with maneuver. His research showed that the supply and demand sides of the current heavy brigade fire support system have many inherent weaknesses that inhibit integration of indirect fires with maneuver. He concluded that the major weakness in the system was found on the demand side since the Infantry and Armor schools were not producing combined arms officers. Additionally, he postulated that artillerymen were not being trained on maneuver doctrine or how to effectively integrate indirect fires with maneuver. He discussed doctrinal-organizational disconnects and reality-doctrinal mismatches. He examined NTC heavy brigade rotations from 1990 through 1994. Additional research material consisted of an examination of the institutional training received by armor, infantry, and artillery officers. The heavy brigade fire support system was examined against the definition of close support fires, likely force projection, battlefield environment, and types of indirect fires required by the heavy brigade in the expected environment.[14]

In "Improving the Demand Side of Fire Support," a 1993 Military Review article, Brigadier General Huba Wass de Czege and Lieutenant Colonel Michael V. Cuff discuss the "supply and demand" characteristics of the fire support system. The demand side of the equation is primarily the domain of the maneuver commander assisted by his FSE, and the supply side is associated with the weapon systems (primarily field artillery and mortars) that deliver fires in support of the maneuver commander. They discuss the topic of indirect fire play at the CTCs and provide their division's approach to preparation for the NTC. They describe the strengths and weaknesses of devices and exercises that units can use in preparation for a training center rotation.

They proposed that the fix for indirect fires was to be found in training, professional habits, and hardware as opposed to any doctrinal solution. They offer extensive advice for a pre-rotation training program that they had field-tested in the First Infantry Division. The training program focused on seven critical areas: commander's intent and concept for fires; observation--trigger plan; rehearsals; target refinement; fire support element operations; call for fire procedures; and use of mortars.[15]

In "The DS Artillery's Staff Planning Process--Adjustments for Success at the NTC," a 1992 Field Artillery article, Lieutenant Colonel Albert F. Turner discussed shortfalls in the staff planning process that adversely affected the responsiveness of fires. His conclusion was that the staff planning process did not support the needs of the artillery due to timing challenges in the development of orders and due to inadequacies in the FA support plan. He proposed several modifications to the staff planning process to accelerate the FA battalion's ability to rapidly develop a FASP that supports the brigade plan. He also offered insightful guidance on the scope and conduct of artillery rehearsals.[16]

The Center for Army lessons Learned (CALL) has published numerous observations, trends, and lessons learned publications. These publications highlight performance deficiencies frequently observed at the CTCs by OCs, and many of these report on the lack of synchronization of artillery fires and maneuver. The most comprehensive among these publications were two newsletters assembled under the direction of Lieutenant Colonel Michael T. Hayes, the Senior Fire Support Combat Trainer at NTC in 1995. "Fighting with Fires" and "Fighting with Fires II" provided timely observations of what was happening at the NTC in the area of fire support. Their purpose was to get information into the hands of the warfighters on recurring trends, and provide tactics, techniques, and procedures (TTP) to help artillery become more effective--ensuring that maneuver and fire support plans are focused on killing the enemy and achieving success on the battlefield. Hayes offered two observations that he found to be critical to successful execution--but seldom seen at NTC. First, he emphasized that units must possess Tactical Standing Operating

Procedures (TACSOPs) which everyone understands and routinely uses. Each unit must have a detailed TACSOP describing the actions or battle drills required for the unit to accomplish a task or mission and must follow this TACSOP during all home-station training events. His second area of emphasis was the necessity for units to conduct realistic home-station training that replicates conditions in which they expect to fight.[17]

Conclusion

A first order review of the doctrinal manuals yields a preliminary assessment that the doctrine is fundamentally sound and relatively consistent across the varied editions. While some of it predates the publication of the most recent edition of the Army's capstone doctrinal manual, FM 100-5, Operations, no glaring inconsistencies are evident. A review of the literature associated with field artillery, fire support, and the combat training centers confirms that that units returning from the NTC frequently obtain less than satisfactory results from the fire support system. A common pattern in the literature appears to be that synchronization of field artillery, fire support, and maneuver plans is inconsistent and in need of improvement. Much effort has revolved around improvement in this area but the work is not yet finished. In spite of the significant documentation of fire support synchronization challenges and proposed fixes, the fire support community has been unable to fix the problem. Causes of this disconnect may include less than adequate doctrine, ineffective training, or information in the literature may either be incorrect or not in a format that is usable to units in the field. Additionally, perhaps units are not adequately resourced to make the required fixes or that corrective information is not getting to those who most need it.

Endnotes

[1]B.H. Liddell Hart, Strategy (New York: Praeger, 1967), 23.

[2]Robert F. Holz, Jack H. Hiller, Howard H. McFann, Determinants of Effective Unit Performance (Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences, 1994), ix.

[3]Ward Keesling, Frank O'Mara, and Desmond Flanigan, "Application of FM 25-100 Training Management Cycle in Armor and Mechanized Infantry Units," in Determinants of Effective Unit Performance, 132.

[4]Robert F. Holz, Francis O'Mara, and Ward Keesling, "Determinants of Effective Unit Performance at the National Training Center: Project Overview," Ibid.

[5]FM 100-5.

[6]FM 6-20, v, 3-1.

[7]FM 6-20-1, Field Artillery Cannon Battalion, vii.

[8]FM 6-20-40, Fire Support for Brigade Operations (Heavy), ix, C-1.

[9]FM 25-100, Training the Force, i-iv.

[10]FM 25-101, Battle Focused Training, i-iii, Appendix D.

[11]TC 6-71, Fire Support Handbook for the Maneuver Commander, 5.

[12]Major Michael J. Bradley, "Field Artillery Doctrine: Does It Support Maneuver Warfare?" Army Command and General Staff College: Fort Leavenworth, KS School of Advanced Military Studies, Nov. 28, 1988.

[13]Major Ray D. Hendrickson III, "Fire Support Planning Doctrine And The Decision Making Process," Army Command And General Staff College, Fort Leavenworth, KS, Master's Thesis, May 03, 1992.

[14]Ibid., 19.

[15]Major Allen W. Batschelet, "Challenging The Heavy Brigade Direct Support Artillery Paradigm For The Brigade Close Fight," Army Command And General Staff College: Fort Leavenworth, KS School Of Advanced Military Studies, Dec 1995.

[16]BG Huba Wass de Czege and LTC Michael V. Cuff , "Improving the Demand Side of Fire Support," Military Review , November 1993, 41-53.

[17]Lieutenant Colonel Albert F. Turner, "The DS Artillery's Staff Planning Process -- Adjustments for Success at the NTC," Field Artillery, October, 1992.

[18]U.S. Army, "Fighting with Fires," CALL Newsletter 95-6, May, 1995, and "Fighting with Fires II," CALL Newsletter 95-10, July, 1995.

CHAPTER 3

RESEARCH DESIGN

This thesis will investigate the issue of improvement of field artillery cannon battalion support by:

1. Describing current U.S. Army fire support and field artillery doctrine.
2. Describing the level of support that the DS field artillery battalion should be able to provide (its desired endstate),
3. Reviewing the level of support the field artillery battalion has demonstrated that it is able to provide, primarily as documented by results at the NTC (current capabilities),
4. Determining what doctrinal and training shortfalls have inhibited progress toward this endstate (obstacles to success and inherent limitations),
5. Identifying what has worked well and why (proven techniques), and,
6. Identifying how more units can progress toward the desired endstate (recommendations for improvement).

Strengths and Weaknesses of This Design

A limitation of this methodology is that it is not practicable to isolate on one factor exclusively since the system has so many variables. This makes it difficult to establish clear causality between doctrinal or training deficiencies and their impact on artillery support to the BCT. Compounding this difficulty is the challenge of deducing conclusions from the study of an issue that contains elements of both art and science. Additionally the significant turnover of personnel in key positions that routinely occurs after an NTC rotation makes it difficult to determine the scope and quality of training that units conducted at home station prior to their

deployments. A final limitation is the fidelity with which any study may interpret the results of an artificial training event to reflect the true degree of support that a unit could be expected to provide in combat.

A strength of this design is that it is able to attack the problem both deductively and inductively. This is an advantage in analyzing an issue that has many moving parts and it is not possible *apriori* to determine where the problems or solutions lay. It tracks the issue of synchronization from its theoretical and doctrinal foundations through its place in fire support and field artillery doctrine to the tools and processes that units use to achieve it. This helps illustrate the challenge that implementing this doctrine imposes on its practitioners. It then takes these doctrinally-developed challenges and looks at examples of how units trained to overcome them. It therefore uses an empirical sample to justify theoretically based propositions, i.e., it looks at what "works."

1. In order to more fully understand the nature and magnitude of the challenge, a description of the fire support system as designed to support the BCT, specifically focusing on the direct support artillery battalion will be formulated from current doctrinal manuals.

2. A description of the desired endstate is also partially provided by U.S. Army doctrine. Maneuver and field artillery doctrine and MTP manuals specify the level of support that the field artillery should be able to provide. The NTC evaluation system, including both the objective and subjective evaluations of OCs, also provides insight. These sources show how a DS cannon battalion should be able to perform its seven basic tasks in order to destroy, neutralize, or suppress the enemy and to help integrate all fire support assets into the combined arms operations of the BCT.

3. The review will be made by an examination of results from DS field artillery battalion rotations to the NTC to highlight relevant recurring trends. It will encompass an examination of reports on field artillery and fire support from CALL and the NTC that provide insight on recurring doctrinal and training shortcomings. The review will also involve examination of take

home packages from NTC rotations in 1995 and 1996 to focus on the performance of the rotating units. This will provide a snapshot of the "current situation" of field artillery support of the direct support FA battalion to the mechanized brigade combat team in CONUS, in particular with regard to the battalion's performance of its "seven basic tasks."

4. Analysis will then key on a determination of what doctrinal shortfalls and challenges have inhibited marked progress toward this endstate. The focal point of this analysis will be on synchronization due to its prevalence as a common theme in the explanations of field artillery support shortcomings in the literature review. This analysis will follow a deductive approach, working from general to specific. It will define and discuss synchronization, fire support, fire support synchronization, and the fire support tools and processes that influence synchronization. It examines critical linkages of events and products that influence objective and subjective measures of synchronization. It evaluates how the DS battalion staff integrates the FASP and wargaming with the brigade fire support plan and wargaming. It will key on the planning phase of an operation which if successfully done, can help set the conditions for success in the preparation and execution phases of the seven basic battalion tasks.

5. An identification of those practices and TTPs that have been used by successful units may be instructive for the rest of the community. This will be based upon a review of CTCWIN THPs, CALL Lessons Learned reports, and articles in professional journals.

6. Identification of techniques to improve synchronization of field artillery support will be developed from several sources. Current doctrine may already hold some answers; it may simply need to be revalidated and reemphasized. This thesis will examine relevant doctrine and contrast it with TTP that have been found to be effective by units at the NTC. A critical review of articles in professional journals addressing NTC artillery and fire support results should also provide recommendations worthy of consideration for further analysis. Ultimately, this study will attempt to determine how units can adjust home station training to increase their capability to provide effective support to the BCT. Proposed training techniques will be evaluated using the nine

principles of training established in FM 25-100, Training the Force: train as combined arms and services team; train as you fight; use appropriate doctrine; use performance-oriented training; train to challenge; train to sustain proficiency; train using multi-echelon techniques; train to maintain; make commanders the primary trainers.[1] This should establish a link between the doctrinal challenges inherent in synchronizing artillery with maneuver and the training approaches that units can use to successfully rise to these challenges.

Endnotes

[1]FM 25-100, Training the Force, November 1988, 1-3.

CHAPTER 4

ARTILLERY SUPPORT TO THE BRIGADE COMBAT TEAM

> The story of field artillery in the present century is largely the tale of the great divorce, of the removal of the guns and their leaders from the close combat of the infantry and the tendency for a single combined arms battle to divide into two separate struggles.[1]
>
> Bruce Gudmundsson, On Artillery

Providing the BCT commander decisive field artillery fires at the right time and place is a significant challenge. In order to consistently achieve desired effects, the direct support field artillery battalion must operate in accordance with fire support and field artillery doctrine and train hard to meet the challenges imposed by this doctrine. In order to more fully understand the nature and magnitude of this challenge, this chapter will describe the fire support system as designed to support the BCT, specifically focusing on the direct support artillery battalion. It will then specify the level of support that the DS field artillery battalion should be able to provide (its desired endstate) and review the level of support the field artillery battalion has demonstrated that it can provide, primarily as documented by results at the NTC (current capabilities).

U.S. Army Fire Support And The Field Artillery System

Fire Support Battlefield Operating System (BOS)

Fire support is one of the seven BOS that the BCT commander must employ effectively if he is to consistently win in combat (and at the NTC). Fire support, according to FM 100-5, Operations, is the "collective and coordinated employment of the fires of armed aircraft, land- and sea-based indirect fire systems, and electronic warfare systems against ground targets to support

land combat operations at both the operational and tactical levels."[2] FM 100-5 goes on to define this BOS as "*the integration and synchronization of fires and effects* [emphasis added] to delay, disrupt, or destroy enemy forces, combat functions, and facilities in pursuit of operational and tactical objectives."[3] In other words, fire support "provides for the planning and execution of fires so the right targets are adequately attacked to achieve the commander's intended effects."[4]

In order for fire support to substantially contribute to a successful battle, two general conditions must exist. First, the fire support system must be thoroughly integrated with the scheme of maneuver and the other BOS. As FM 100-5 states, "Generating effective firepower . . . requires that organic and supporting fires be coordinated with other combat functions such as intelligence, logistics, and battle command."[5] The second fundamental condition is that the BCT commander must fully assume his responsibility to ensure that fires support his scheme of maneuver. "Commanders are responsible for fighting their fire and maneuver assets. They fight much of their fires through the function of fire support, because much of the combat power of fires is not from within their chain of command but from external resources."[6] They must impose their will on the fire support system because it is the function that "binds fire resources together so that the multiple effects of each asset are synchronized with the force commander's intent and concept of operation."[7] Should they fail to do this, they risk fighting without the complementary and synergistic effects of the different BOS integrated to maximize combat power at decisive places and times.

Basic Tasks of Fire Support

In accordance with FM 6-20, Fire Support in the Airland Battle, the fire support system must accomplish four essential tasks in order to destroy, neutralize, or suppress the enemy as required. In addition to applying to the system as a whole, these tasks apply to the individual fire support components as well. These doctrinally assigned tasks do not replace the traditional missions, roles, and operations of the different fire support assets. They simply provide a common

point of departure for a unified fire support system and provide a frame of reference with which to evaluate its effectiveness. These requirements, referred to as the four basic tasks of fire support, are:

1. Support forces in contact
2. Support the force commander's battle plan
3. Synchronize fire support
4. Sustain fire support

Support Forces in Contact

Fundamental to the performance of this task is the ability to respond to forces engaged with the enemy. This includes ground and air maneuver forces, naval gunfire, and air forces flying in support of ground operations. The performance of this task enhances the survivability of friendly forces and helps preserve their freedom of maneuver. The field artillery accomplishes this task through its roles of close support, counterfire, and interdiction.[8] The direct support tactical mission of the cannon battalion to the BCT is an example task organizing field artillery to fulfill this task.

Support the Force Commander's Battle Plan

The performance of this task enables the BCT commander to influence the battle with fires. It gives him the means to destroy, neutralize, or suppress those targets whose attack will be most beneficial to the successful accomplishment of his mission. The fire support system provides timely and accurate fires to support the force commander's battle plan.[9]

Synchronize Fire Support

Synchronization of fire support is *"the precise arrangement of coordinated activities in time, space, and purpose to produce the most effective fires"* (emphasis added).[10] The BCT synchronizes fires using the decide-detect-deliver-assess (D3A) targeting methodology during the

TDMP. The FSCOORD synchronizes the fire support system for the BCT commander to ensure that the right attack means are delivered on the right target at the right time. Fire support components must not only be internally synchronized but with other BOS as well.[11]

Sustain Fire Support

The accomplishment of this task ensures that the BCT commander can rely on the availability of his fire support assets throughout an operation. Sustaining fire support helps ensure the maintenance and survivability of the fire support system and involves the logistic and technical actions necessary to support the fire support assets available to the BCT commander.[12]

Fire Support Responsibility in the Maneuver Brigade Combat Team

The supported maneuver commander has the ultimate responsibility for the coordination and employment of the fire support assets provided to him to accomplish his mission. He must ensure that he effectively controls his fire support to increase his probability of mission accomplishment. In integrating fire support into operations, the BCT commander must ensure that he considers the adequacy, flexibility, and continuity of his fire support.[13] The FSCOORD is the BCT's principal advisor and coordinator for all fire support matters, but the BCT commander must make the final decision on its employment.

The direct support battalion commander is the FSCOORD for the maneuver brigade he supports. His principal assistant is the brigade fire support officer (Bde FSO). The field artillery battalion commander, in his capacity as the brigade FSCOORD, establishes fire support organizations in each maneuver battalion and company to assist in the decision and execution process. Brigade and battalion fire support elements (FSEs) are located in the maneuver unit tactical operations center (TOC). These organizations enable the maneuver commander to direct the use of his fire support assets. Air support is coordinated through the brigade S3 air and the brigade and battalion air liaison officers (ALOs) and their corresponding tactical air control parties (TACPs). When naval support is available, an air/naval gunfire platoon from the ANGLICO will

be also be integrated into the brigade FSE. This thesis focuses exclusively on those actions of the field artillery component of this fire support organization (figure 1).

FIRE SUPPORT RESPONSIBILITY FOR FIELD ARTILLERY IN THE MANEUVER BRIGADE COMBAT TEAM

BCT Commander
FSCOORD (DS Battalion Commander)
Brigade FSO
Battalion/Task Force FSOs
Company/Team FSOs

Figure 1.

Synchronizing Fires in the BCT

Fire support coordination is the product of the methods and processes employed by the FSCOORD to synchronize fire support for the BCT commander. It involves both the tactical and technical considerations necessary to deliver fires in accordance with the brigade commander's intent for fires. Crucial to effecting this coordination is a clear understanding of the commander's visualization of his tactical objectives and how specific actions must be sequenced to achieve them. FM 6-20 establishes principles to be used by fire supporters in fire planning and coordination in order to efficiently utilize available assets to achieve required effects (figure 2). [14]

FIRE SUPPORT PLANNING/COORDINATION PRINCIPLES

1. Plan early and continuously
2. Exploit all available targeting assets
3. Consider the use of all available lethal/nonlethal attack means
4. Use lowest echelon capable of furnishing effective support
5. Use most effective means
6. Furnish type of support requested
7. Avoid unnecessary duplication
8. Consider airspace coordination
9. Provide adequate support
10. Provide adequate and effective coordination
11. Fire support coordinating measures
12. Provide for flexibility
13. Provide for safeguarding and survivability of friendly forces and installations

Figure 2.

Field Artillery

FM 100-5, Operations, discusses the role of field artillery and establishes a high standard for it.

> A principal means of fire support in fire and maneuver is the field artillery. It not only provides fires with cannon, rocket, and missile systems but also integrates all means of fire support available to the commander. Field artillery can neutralize, suppress, or destroy enemy direct fire forces, attack enemy artillery and mortars, and deliver scatterable mines to isolate and interdict enemy forces or protect friendly operations. Field artillery units contribute to attacking the enemy throughout the depth of his formations and suppress enemy air defense systems to facilitate ground and air operations. As mobile as the maneuver force it supports, field artillery provides continuous fires in support of the commanders' schemes of maneuver.[15]

FM 6-20, Fire Support in the AirLand Battle, distills this to its essentials: "the mission of the field artillery is to destroy, neutralize, or suppress the enemy by cannon, rocket, and missile fire and to help integrate all fire support assets into combined arms operations."[16] This characterizes the dual-nature of the field artillery-fire support relationship which dictates a division of responsibility for the FSCOORD/field artillery battalion commander.

Tactical and Technical Effects of Artillery Fire

Artillery fires can achieve several effects on enemy targets and enemy courses of action. Artillery fires can destroy, neutralize, or suppress enemy targets. These terms describe the technical effect achieved by the fires. The maneuver commander employs these fires to achieve tactical effects on the enemy course of action. These desired tactical effects may be to delay, limit, divert, block, disrupt, or destroy enemy forces. Artillery can also be employed in nonlethal attack to exploit, disrupt, and deceive the enemy and degrade the effectiveness of his systems with smoke and illumination munitions.

The Seven Basic Tasks Of The Field Artillery Cannon Battalion

FM 6-20-1, The Field Artillery Cannon Battalion, explains the tasks that the field artillery battalion must accomplish if it is to effectively "shoot, move, and communicate." It establishes the seven basic tasks of the artillery cannon battalion which serve as unifying factors for the system: coordinate fire support, acquire targets, deliver field artillery fires, communicate, move, maintain and resupply, and survive (figure 3).[17]

SEVEN BASIC TASKS OF THE FIELD ARTILLERY BATTALION

1. Coordinate fire support
2. Acquire targets
3. Deliver field artillery fires
4. Communicate
5. Move
6. Maintain and resupply
7. Survive

Figure 3.

Coordinating fire support involves those processes that the FSCOORD uses to ensure that the effects of fires are integrated into the maneuver commander's operation. Acquiring targets involves employing assets such as radar, observers, combat observation lasing teams (COLTs),

and the intelligence system to locate in a timely manner those targets that the BCT commander needs attacked. Delivery of field artillery fires involves the employment of attack systems to attack targets with the proper weapon and ammunition mix and requires the efforts of the entire gunnery team to meet the five requirements for accurate predicted fire (target location, meteorological conditions, firing unit location, weapon and ammunition data, and computational procedures) and put "steel on target." Communication is a critical function that enables the battalion commander to command, control, and coordinate the efforts of the numerous agencies involved in the coordination and delivery of fires. Movement of the field artillery battalion must be closely integrated with the maneuver unit it is supporting in order to facilitate its positioning to ensure that sufficient artillery is in the right position to fire to the required range on the battlefield. Maintenance, resupply and survive are significant considerations for artillery battalions, as well as all units, as they involve those operations necessary to maintain and protect the combat power of the unit. Resupply poses a significant challenge to field artillery units due to the vast quantity of ammunition required.

The Direct Support Tactical Mission.

An artillery battalion in direct support of a maneuver brigade is primarily concerned with the field artillery needs of only that brigade and answers its calls for fire as its first priority. The DS battalion commander positions his unit where it can best support the brigade's scheme of maneuver. A habitual relationship should exist between supporting and supported units in order to facilitate coordination and training. Direct support is the most decentralized standard tactical mission assigned to field artillery cannon battalions.[18] A direct support battalion provides the minimum "adequate" support required by the BCT in accordance with the principles of organizing field artillery for combat.

Duties of Key Personnel in the Direct Support Battalion

As previously stated, the direct support battalion commander, as the brigade FSCOORD, is the BCT commander's principal advisor for all fire support matters. His primary responsibility is to maximize the ability of his battalion "to integrate its fires with those of all other fire support systems at the time and place and in the quantity required by the supported maneuver commander."[19] His three principal assistants are his executive officer, his operations officer (S-3), and the brigade FSO. These three individuals are to a major degree responsible for all coordination of the battalion's assets and efforts in the battle. The brigade FSO is responsible for telling the battalion what it is required to do (in support of the BCT fight), the XO for providing and sustaining the means (equipment, maintenance, supplies, and ammunition) with which to operate, and the S-3 to determine best how the battalion should operate to accomplish its tasks with its available means. In sum they are largely responsible for the ends, ways, and means of the battalion's operations in the accomplishment of its seven basic tasks to support the BCT.

The battalion executive officer is the battalion's second in command and is also the senior logistician in the battalion. FM 6-20-1 concedes that these dual responsibilities may create a situation in which his competing priorities could impair his ability to assist the FSCOORD in his primary duties. While the realities of tactical operations dictate that the XO must balance these competing demands, FM 6-20-1 appears to de-emphasize the XO's role as the FSCOORD's second in command. It says that the "S3 in particular must understand the commander's intent for the battalion and make tactical decisions accordingly."[20] While the S3 obviously plays the pivotal role in the centralized control of the battalion at the TOC, this statement may inadvertently convey the unwanted message that the XO does not need to be completely familiar with the commander's intent, which may have an adverse impact upon the battalion's support to the BCT should he not be focusing on his second in command duties when required to do so. The XO does not normally operate out of the TOC which differs from the role of the Bn XO in infantry and armor units.

The battalion S3 runs the TOC for the commander. He is responsible for the production of the field artillery support plan (FASP) which includes planning for positioning, movement, and employment of all firing units (organic, attached, or reinforcing) and target acquisition assets. He is the principal advisor to the commander on field artillery organization for combat, FA attack guidance, positioning of firing and target acquisition units, artillery estimates of the situation, target selection standards, and integration of radar zones to support the BCT commander.[21] He also oversees the operations of the battalion fire direction center which supervises the tactical and technical fire control within the battalion.

The brigade FSO's duties are not enumerated in the basic battalion manual, FM 6-20-1; they are contained in FM 6-20-40, Fire Support for Brigade Operations (Heavy). The brigade FSO is the FSCOORD's principal assistant for fire support and works at the brigade TOC. He is responsible for keeping the BCT commander informed of the status and capabilities of available fire support assets. He also plays an important role in the development of the brigade order through his involvement in the estimate process and wargaming courses of action. He develops the fire support plan for the BCT and communicates this and other essential information to the direct support battalion to enable it to integrate its efforts in support of the BCT fight. He is the critical link from the BCT TOC to the DS battalion.

Additional Considerations Regarding Field Artillery Support

In any discussion of the capabilities of the field artillery system, it is necessary to enumerate its limitations as well. The effectiveness of artillery support in any given situation may be limited by the friendly and enemy situations, terrain, weather, and logistical support.[22] These limitations may effect weapon systems and ammunition, target acquisition and battlefield surveillance, or fire support coordination. The FSCOORD and his staff must be proactively involved in the brigade planning process to ensure that the maneuver plan adequately accounts for these limitations as well as weapon ranges, weapon accuracy, munitions effectiveness, and supply

and maintenance considerations. A critical task of the FSCOORD is to stay abreast of, and keep the maneuver commander fully apprised of, the impact that any of these limiting factors have on his ability to execute his basic tasks in order to provide the required level of support to the BCT.

FM 6-20-1 also recommends five areas for consideration when planning for the employment of fire support assets in support of ground maneuver operations. These considerations are: fire support tasks, command and control, fire support planning and coordination, positioning and displacement, and any other consideration dictated by the mission or tactical situation (figure 3).[23] There is some redundancy with other enumerated tasks and principles (e.g., positioning and displacement), but there is also an expanding list of requirements (note that "fire support planning and coordination" encompasses the 13 fire support planning and coordination principles from FM 6-20 (figure 2). This suggests that the challenge of effectively employing field artillery is even more complex that initially described.

AREAS FOR CONSIDERATION WHEN PLANNING FOR THE EMPLOYMENT OF FIRE SUPPORT ASSETS IN SUPPORT OF GROUND MANEUVER OPERATIONS.

1. Fire support tasks
2. Command and control
3. Fire support planning and coordination
4. Positioning and displacement
5. Any other consideration dictated by the mission or tactical situation

Figure 4.

Fire Support System Desired Endstate

U.S. Army doctrine provides a description of the desired endstate for field artillery support to the maneuver BCT. Maneuver and field artillery doctrine and MTP manuals specify the level of support that the field artillery should be able to provide. NTC evaluations, including both the objective and subjective assessments of OCs, also provide insight.

The Standards

Mission training plans (MTPs) provide the "what" that units should be able to accomplish. ARTEP 6-115-MTP, Mission Training Plan for Field Artillery Cannon Battalion Headquarters and Headquarters Battery; Headquarters, Headquarters and Service Battery; or Service Battery, provides a mission-oriented training program that is designed to provide trainers with a tool with which to evaluate their units' level of training. It separates each of the seven basic tasks into their component collective tasks, separating these component collective tasks by BOS. The MTP establishes specific time and accuracy standards for the processing of fire missions. This provides more than adequate standards for assessing the performance of the "deliver field artillery fires" task and is used throughout the Army to assess units' proficiency in this task during external evaluations (EXEVALS). This is both necessary and objectively achievable since delivery of fires is fundamentally a "scientific" task. Some of the other basic tasks are more difficult to objectively quantify. In these cases, standards are not specified, but subtasks are. This is in recognition of the fact that some tasks do not necessarily have quantifiable and measurable yardsticks with which to measure their application.

Review and Assessment

Results from heavy brigade rotations to the NTC highlight relevant recurring trends. Both empirical and subjective assessments provide insight to this issue. A review of NTC quarterly reports from CALL highlights relevant recurring doctrinal and training shortcomings regarding the seven basic tasks of the field artillery cannon battalion as well as the fire support task of provide synchronized fires. This, in addition to a review of take home packages from rotations in 1995 and 1996 provides an assessment of the performance of rotating units. Specifically, this review encompasses three sections of THPs: the brigade summary, the direct support battalion O & I section, and the brigade fire support section. This provides a snapshot of the "current situation" of

support provided by the direct support FA battalion to the mechanized brigade combat team in CONUS.

Limitations of NTC Lessons

In using NTC rotation results as a source of empirical evidence to assess the effectiveness of artillery support to the BCT, several mitigating factors must be considered. First of all, the primary purpose of the rotation is training, not testing. This ultimately makes any determination of "success" a subjective call. Additionally, OCs' THP comments are generally focused on those tasks that a unit needs to improve upon as opposed to those with which they are usually successful. This may tend to skew the observations, and any corresponding deductions from them, in a negative light. Additionally, it is not possible to predict with complete accuracy how well a unit will perform in combat based upon observations of its peacetime training results.

Recent Results

CALL reports "Fighting With Fires" and "Fighting With Fires II," published in 1995, reported that NTC field artillery/fire support OCs indicate that one of the factors that may contribute to the lack of synchronization of fire support is that the fire support annexes are inadequate as planning, preparation, and execution tools because they do not adequately describe the scheme of fire support for an operation.[24] This shortfall contributes to a recurring trend observed at the NTC, namely the lack of a well-developed, completely disseminated, and well understood scheme of fire support.[25] This shortfall is a result of units' inability to adequately address several of the principles of fire support planning and coordination enumerated in figure 2 (in particular, use most effective means, furnish type of support requested, provide adequate support, provide adequate and effective coordination, and provide for flexibility) which directly and adversely effect the accomplishment of the basic artillery battalion tasks of coordinate fire support and deliver field artillery fires. "Fighting With Fires II," also discusses progress made, and

progress still to be achieved through the improved use of troop leading procedures at the battery level to improve in the delivery of fires.[26]

Almost all NTC observations indicate that units continue to be challenged with staff coordination, certainly not a new trend for units conducting tactical operations, but an important one nonetheless. This problem is not unique to field artillery units but applies to myriad organizations. Several other articles in the reports, while focusing on different areas, all result from the same problem--lack of coordination. Reception, Staging, and Onward Movement Integration (RSOI) operations, recently incorporated into NTC rotations, indicate that much work is to be done to ensure that any adverse impact on logistic support on the rapid build-up of combat power is minimized through a proactive C2 structure and battle-staff coordination. Similarly, reports on ammunition resupply shortfalls point to the same factors of staff coordination. Any significant shortcoming in resupply of this essential component of the artillery system, obviously has an adverse effect on the delivery of fires. Any degradation in a battalion's ability to deliver fires when and where required, directly and adversely effects the ability of the FSCOORD to ensure that his fires are synchronized with maneuver.

NTC experience has shown that the field artillery system has its limitations. In "Training the Core Competencies," published in Field Artillery in 1995, several former CTC senior fire support OCs reported their assessment.

> In a perfect world, a 155-mm FA battalion can fire 10 massed (i.e., battalion three-round) "killer missions" per hour, and artillery can only apply fires decisively at a handful of points in a single battle--a fact planners must consider. They must . . . balance the requirements for killer missions with other fire support tasks (e.g., obscuration fires, etc.) that don't require massed fires.[27]

FSCOORDs, FSOs, or DS battalion S-3s who do not fully account for the fog and friction of battle in their plans, occasionally exhibit the tendency to use overly optimistic planning factors in their plans. A back of the envelope calculation shows that in a 60 minute brigade battle, a DS battalion could fire 10 battalion 3 round fire for effect missions, allowing for approximately 6 minutes per mission (MTP standard is 5 minutes, 40 seconds for a battalion mass, low-angle,

adjust fire mission with a forward observer using a ground/vehicular laser locator designator (GVLLD): standard is 3:40 for the first volley of a battalion mass, fire for effect, when ready mission, and 1 minute for each subsequent round). This rough calculation does not account for simultaneous missions, but neither does it account for the decrement in killer missions (high explosive or improved conventional munitions) fired due to emplacing FASCAM minefields or firing non-killer munitions such as smoke and illumination. Myriad factors routinely decrement the battalion's delivery of fires even further, to include counterfire, threat of counterfire (survivability moves), electronic warfare, maintenance status of key systems, survey support, ammunition management, and resupply to name just a few.

Providing the timely and accurate artillery fire to the brigade combat team is a significant challenge. The direct support artillery battalion must operate in accordance with fire support and field artillery doctrine in order to synchronize its effects with the other BOS. This chapter has described the fire support system within the BCT, specifically focusing on the direct support artillery battalion, in order to better understand the nature and magnitude of this challenge. A review of results from recent rotations and observations from OCs has verified that the DS artillery battalion routinely is able to provide a level of support that falls short of the doctrinal ideal desired endstate.

Endnotes

[1]Bruce Gudmundsson, On Artillery (Westport, CT: Praeger, 1993), 163.

[2]FM 100-5, Operations, 2-13.

[3]Ibid.

[4]Ibid.

[5]Ibid.

[6]Ibid.

[7]Ibid.

[8]FM 6-20, Fire Support in the AirLand Battle, 1-3.

[9]Ibid.

[10]Ibid.

[11]Ibid.

[12]Ibid.

[13]FM 100-5, 2-23.

[14]FM 6-20, 3-4.

[15]FM 100-5, 2-23.

[16]FM 6-20, 2-8.

[17]FM 6-20-1, The Field Artillery Cannon Battalion, 1-1.

[18]FM 6-20, 2-9.

[19]FM 6-20-1, 3-3.

[20]Ibid.

[21]Ibid., 3-4.

[22]Ibid., 2-1.

[23]Ibid.

[24]Samuel R. White, Jr., "Development of the Brigade Scheme of Fire Support," in Fighting with Fires II, July 95, 25.

[25]Ibid.

[26]Thomas Kelly, "FA Battery Troop Leading Procedures, The Next Step," Ibid., 44.

[27]Baxter, Dunn, Hayes, Palmer, "Training the Core Competencies," in Field Artillery, 1995, 9.

CHAPTER 5

THE DOCTRINAL CHALLENGE OF SYNCHRONIZING ARTILLERY FIRES

> The most magnificent execution can rarely offset the weight of a flawed concept.[1]
>
> General William E. Depuy,
> The Battalion and Brigade Battlestaff

Analysis now keys on a determination of what doctrinal shortfalls and challenges have inhibited units' progress toward the desired endstate (obstacles to success and inherent limitations). Following this analysis, it will identify what has worked well and why (proven techniques), and, identify how more units can progress toward the desired endstate (recommendations for success). In essence, this examination seeks first to understand the challenge of artillery support to the BCT, and then to determine how the artillery battalion can improve the ways that it employs its available means to achieve the required ends. This provides the foundation for highlighting unit training considerations necessitated by the challenges of implementing this doctrine that will be enumerated in the next chapter.

Art versus Science of Artillery Support

Examined separately, each of the tasks, principles, and considerations associated with artillery support to the brigade may be considered the result of a relatively structured process or set of procedures that, to varying degrees, may be classified as mechanical in nature. Collectively however, these tasks challenge artillery leaders to be both scientific and artistic in their approach to effecting their accomplishment. What is apparent is that the FSCOORD and his staff (both the DS battalion TOC and his fire supporters in the FSE) must be highly proficient in the labor intensive science of support and coordination procedures in order to be able to practice the art. There are

too many doctrinal considerations to be confident that any checklist approach to their accomplishment could consistently ensure that the artillery would be effectively synchronized with the scheme of maneuver.

The challenge to the BCT commander and his FSCOORD is to look at the ends to be achieved by his artillery in order to be successful (synchronization of artillery fires with maneuver at the decisive time and place), the means available to accomplish the mission (field artillery system resources such as weapon systems, ammunition, target acquisition systems, and C3 headquarters), and determining the most effective and efficient ways of applying those resources to achieve the desired endstate. One can see the separate pieces of the field artillery support puzzle, but the thread of continuity between these elements may not be so apparent (see figure 5). What is not visible is the essence of the art necessary to create a cohesive picture out of the distinct components. It calls to mind the famous quote from French painter Georges Braque concerning creativity: "The only thing that matters in art is the part that cannot be explained."[2] Our doctrine goes to great lengths in dissecting and categorizing the disparate yet important considerations, principles, tasks, and relationships of the system, yet it ultimately remains a test of the leader's creativity and imagination in ensuring that the separate pieces are integrated into a coherent whole.

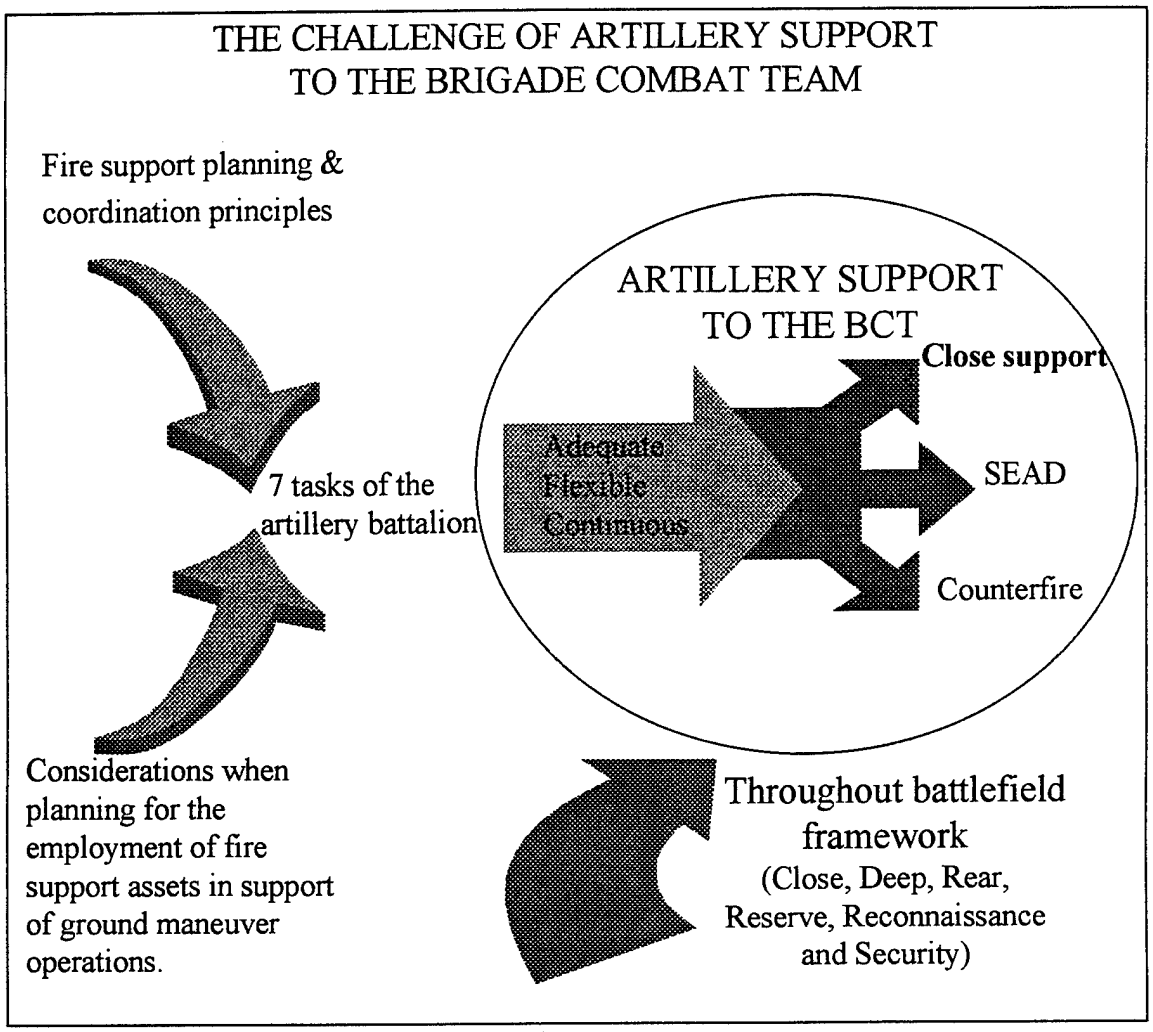

Figure 5.

Figure 5 illustrates the discretely quantified components of the systems in which the artillery battalion must operate and to some degree depicts the magnitude of the "who, what, when, where, why, and how" of artillery support. The artillery battalion must be able to execute its seven basics tasks in support of the BCT throughout the entire battlefield framework (close, deep, rear, security, and reserve). Within this framework, it must be able to fulfill its roles of close support, counterfire, and suppression of enemy air defense (SEAD) and it must ensure that it can provide the BCT adequate, flexible and continuous support. In order to accomplish these tasks both

efficiently and effectively, it must operate in accordance with fire support planning and coordination principles and ensure that it adequately addresses the essential considerations when planning for the employment of fire support assets in support of ground maneuver operations.

Leaders must recognize the need for mental flexibility in order to adapt to the myriad variables that affect the system. The overlapping and competing demands listed here make it imperative that the FSCOORD and his key assistants have a finely developed sense of what is critical to success and when it is critical. This also makes it clear that one man cannot do it alone. The FSCOORD needs a highly trained staff in both the brigade TOC led by his FSO and in the DS battalion TOC if he is to have any reasonable expectation of being able to consistently provide the BCT commander the support that he requires. NTC reports consistently bear this out.

What is lacking from the artillery's doctrinal literature is thorough guidance on "how to fight" the artillery. FM 6-20-1 provides a foundation by necessarily describing the separate pieces of the system, but it does not focus in depth on how to conduct a specific operation as do the basic maneuver manuals. While some of this information is contained in FM 71-123 and FM 6-20-40, it would be useful (if not essential) for the artillery manual(s) to expand their focus to include not only what the system is composed of, but more importantly, how it "fights." Perhaps the tangible value of an initiative such as this may appear to be minimal (some of the material is in FM 6-20-1, FM 6-20-40, FM 71-123, FM 6-20-20, Fire Support at the Battalion Task Force and Below, and FM 6-71), but logic would suggest that this effort would force artillerymen and maneuver to begin synchronizing their thought processes before the first unit crosses the LD.

Inaccurate Replication of the Tactical and Technical Effects of Artillery Fire

Due to an unavoidable shortfall in the ability of NTC to replicate combat conditions with complete realism (no training event will involve the firing of live artillery directly at OPFOR forces), it is necessary to understand how artillery effects impact on a training center battle. Beyond the description of tactical and technical effects that artillery fires provide as described in

the previous chapter, artillery fires, when employed effectively, also have a significant psychological effect on soldiers in battle (which is also closely linked to suppressive fires). While the psychological effect of artillery fires on soldiers, both friendly and enemy, is beyond the scope of this study, it is important to recognize that it exists and can be an important combat multiplier for the commander who can use it to his advantage. The U.S. Marine Corps succinctly articulates the existence of this effect in its baseline doctrinal manual, FMFM 1, Warfighting:

> The aim [of fires] is not an unfocused application of firepower for the purpose of incrementally reducing the enemy's physical strength. Rather, it is the selective application of firepower in support of maneuver to contribute to the enemy's shock and moral disruption. *The greatest value of firepower is not physical destruction the cumulative effects of which are felt only slowly but the moral dislocation it causes* [emphasis added].[3]

The significance of the psychological effect to this thesis is that this effect is not replicated at the NTC with its multiple integrated laser engagement system (MILES) and simulated area weapons effects (SAWE) instrumentation. MILES and SAWE can provide an objective assessment of technical effects of fire on specific categories of targets; they cannot replicate the conditions that would bring the effects of stress to bear on OPFOR soldiers and leaders as if they were in actual combat. This is a significant consideration for this study since it relies on NTC rotation results for much of its "empirical" data. The result of this is that artillery fires at the NTC simply cannot be given "proper credit" for the contribution that they would make on the battlefield due to the unavoidable sterility of this environment.

Causes of Insufficient Progress Toward Endstate

Several doctrinal and training shortfalls and challenges have inhibited units from making consistent progress toward the desired endstate. Due to its prevalence as a common theme in the explanations of field artillery support shortcomings in the literature review, synchronization serves as the focal point of this analysis. Furthermore, its causes and effects may be seen across all of the basic tasks of the artillery battalion: coordinate fire support, acquire targets, deliver field artillery fires, communicate, move, maintain and resupply, and survive. Following a deductive approach,

this analysis works from the general to the specific. It defines and discusses synchronization, fire support synchronization, field artillery synchronization, and the fire support tools and processes that affect synchronization. Critical linkages of events and products (DS battalion staff integration of wargaming and the FASP with brigade wargaming and the fire support plan) influence objective and subjective measures of synchronization. It will compare these linkages with the seven basic tasks of the cannon battalion to determine if these tools facilitate their accomplishment. Analysis focuses on synchronization in the planning stage of an operation because synchronized planning helps set the conditions for success in the preparation and execution phases.

Synchronization

At the risk of employing a concept that is overused almost to the point of saturation in U.S. Army doctrinal literature, the concept of synchronization accurately depicts the ideal relationship between field artillery fires and maneuver. It is therefore important to understand what synchronization is, how it relates to the application of combat power at decisive times and places, and to understand how artillery support should be synchronized with the maneuver plan. As described in FM 100-5, "synchronization is arranging activities in time and space to mass at the decisive point."[4] Synchronization is about ensuring that the effects of fires are relevant to the execution of the ground commander's operation by achieving mass where and when it can have the desired tactical effect, because "in the end, the product of effective synchronization is maximum use of every resource to make the greatest contribution to success."[5]

This concept is not new. As one example of many provided by military history, Antoine Henri Jomini, the preeminent Swiss war theorist, advocated that it was imperative to "throw the mass of forces at the decisive point"[6] and "arrange that these masses not only be thrown on the decisive point, but that they shall engage at the proper times and with ample energy."[7] His influence is clear in FM 100-5, Operations: "Mass the effects of overwhelming combat power at the decisive place and time. Synchronizing all the elements of combat power where they will have decisive effect on an enemy force in a short period

of time is to achieve mass."[8] FM 6-20, Fire Support in the AirLand Battle, states that "fire support weapons and units . . . must be able to provide maximum massed fires when and where they are required to support the battle plan."[9] The linkage for the U.S. artilleryman is clear and compelling.

How Synchronization Is Achieved

Having established that synchronization is important, it is necessary to understand how commanders can bring about this synchronization of efforts to produce synchronized effects in time, space, and purpose. Time provides the "when," space the "where," purpose the "why;" the "who" and the "what" are generally either specified or implied; therefore, the real challenge comes in the "how." FM 100-5 describes the essential first steps toward realizing the "how."

> Commanders first visualize the consequences to be produced and how they sequence activities to produce them. Staffs must understand their commander's intent since they make a large part of the synchronization plan happen. Synchronization thus takes place first in the minds of commanders and then in the actual planning and coordination of movements, fires, and supporting activities . . . . Most of all, synchronization requires a clear statement of the commander's intent.[10]

Combat Power

History has repeatedly shown that commanders win by "massing the effects of combat power at the decisive time and place." Combat power is the product of effectively combining the elements of maneuver, firepower, protection, and leadership. At its core, massing the effects of combat power involves the synergistic and symbiotic relationship between the effects of fire and maneuver. FM 100-5 states that commanders integrate and coordinate a variety of functions to sustain combat power because "winning . . . depends on an understanding of the dynamics of combat power and putting them together to ensure defeat of the enemy."[11] Ultimately, the effects of combat power brought to bear on the enemy may be physical, tactical, psychological, or any combination thereof.

Maneuver is the movement of combat forces to gain positional advantage relative to the enemy, usually done in order to deliver or threaten delivery of fires. Firepower is the destructive

force applied to the enemy, a significant percentage of which, in the BCT, comes from the fire support system. FM 100-5 is unmistakable in its description of their symbiotic relationship: "Maneuver is rarely effective without firepower and protection . . . . *Maneuver and firepower are inseparable* [emphasis added] and complementary dynamics of combat. Although one might dominate a phase of the battle, the synchronized effects of both characterize all operations."[12]

A lack of appreciation for this relationship is evident in the tactical orders process used by the U.S. Army. Separate paragraphs in the five paragraph OPORD address the scheme of maneuver (3.a.(1)) and fires (3.a.(2)). While this division is intended to allow its users to focus on discrete topics of the operation as required, this same division can contribute to the breakdown between the "inseparable" elements of fire and maneuver. This investigation has not revealed empirical evidence to demonstrate that a revision of the OPORD format would improve synchronization of fires and maneuver (one would have to evaluate the performance of a number of units who employed a combined "fire and maneuver" paragraph in their OPORD in order to assess this technique); however, it seems reasonable to postulate that either our fundamental doctrine, "maneuver and firepower are inseparable," or our fundamental tool for conducting tactical operations, the five paragraph OPORD, are flawed at worst, or simply inconsistent at best.

FM 71-3 recognizes that fires cannot simply be added into a plan but rather that they should be an integral part of it, but the fact that this point is not stressed until the seventh chapter, "Support of Combat Operations," indicates that this concept receives less emphasis than our capstone doctrinal manual would suggest is necessary. Successful units understand that nesting their fires to achieve the purpose of the plan is essential. As Was de Czege and Cuff found, "the effective commander builds courses of action that include desired effects of indirect fires from the beginning to the end."[13] The integration of desired effects into the planning of a course of action helps to ensure that fires and maneuver will be synchronized.

Synchronize The Fire Support System

Commanders must ensure that fires and maneuver are synchronized in order to capitalize on the benefits of their synergistic employment. There is no lack of emphasis in U.S. Army doctrinal literature on the importance of this issue. FM 100-5, Operations states that "synchronizing fires with maneuver is critical to the successful prosecution of combat operations," and that "fire support is the function that binds fire resources together so that the multiple effects of each asset are synchronized with the force commander's intent and concept of the operation."[14] Fire supporters take the lead in synchronizing fire support through fire support coordination, beginning with a clear understanding of the BCT commander's concept of the operation. The decide-detect-deliver-assess (D3A) methodology for targeting and battle-tracking is used by fire supporters and maneuver to assist in fire support synchronization. The timely, efficient, and effective use of this methodology initiated during the planning phase enables the commander to attack the right target with the best weapon at the right time.

Field Artillery Synchronization

Synchronizing the field artillery with maneuver makes the artillery relevant; failure to do so either makes it irrelevant, or may simply limit its contribution to the achievement of technical effects (suppress, neutralize, destroy) without achieving the required tactical effect (delay, disrupt, or limit). According to numerous accounts from NTC rotations, a problem is that fire support agencies require more planning time than maneuver units and they may not receive essential information with which to plan until late in the process. The importance of this cannot be overstated, because as maneuver brigade commanders are taught in their Tactical Commander's Development Course, "timing remains the common denominator of the battlefield operating systems."[15] Again, a concept that is certainly not new, yet critically important nonetheless.

Staff Products and Processes Which Affect Field Artillery Synchronization

Fire Support Plan

The fire support plan is designed to contain the information necessary for understanding how fire support will be used to support the maneuver commander's operation. It results from the fire support estimate and is an integral part of the commander's plan. The essential elements of a fire support plan are:

1. Allocation of fire support assets.
2. Projected changes to the allocation of fire support assets based on tactical contingencies.
3. Coordination and synchronization instructions for detection and attack of high-payoff targets.
4. Requirements for positioning of assets, composition of basic loads, the controlled supply rate, and required target damage.
5. Restrictions on ammunition expenditures, types of fires, areas of employment, and creation of obstacles; limiting risk to friendly troops; and minimizing collateral damage.
6. Fire support coordinating measures.
7. Special instructions on rules of engagement, communications, and logistic support.
8. Locations of command posts, ammunition supply points, and ammunition transfer points.

What the fire support plan does not contain is a thorough description of the scheme of fire support for an operation as previously mentioned.[16] This shortfall contributes to a recurring trend observed at the NTC, namely the lack of a well-developed, completely disseminated, and well-understood scheme of fire support.[17] What is present in the fire support plan is a list of disparate yet important information regarding fire support; what may be hard to discern is the thought process behind the employment of fire support in the operation that serves as the glue or foundation for all required support ("nesting" the task and purpose of fire support assets with the task and purpose of the supported maneuver unit helps to alleviate this). This may be compounded by the fact that FM 6-20 states that the implementation of the fire support plan is the responsibility of the

FSCOORD, his staff, and subordinate FSOs.[18] While the fire supporters clearly have primacy in effecting its execution, the maneuver commanders remain responsible for its ultimate execution.

OCs report that when a scheme of fires is sent to the DS battalion TOC, it often arrives too late for the S3 to make necessary adjustments. This points to the imperative to conduct parallel planning between the brigade and DS battalion TOCs. This is necessary to ensure that the battalion has the time necessary to make critical adjustments in its preparations spanning the seven basic tasks of the battalion. These preparations can be time consuming and resource intensive. They include preparations in the coordination of fire support, the repositioning of target acquisition and delivery assets, synchronization of movement, positioning, and terrain management, communications support (retransmission requirements for COLTs), resupply and redistribution of special ammunition, and steps necessary to enhance the units' survival prospects.

Field Artillery Support Plan

The field artillery support plan (FASP) is the primary document with which the cannon battalion plans to execute its mission and assigned tasks as specified in the BCT's OPORD. It is the battalion commander's translation of the fire support plan (or fire support annex) into a field artillery specific plan. It applies to both the direct support battalion and its reinforcing artillery. It addresses all non-SOP items necessary to the accomplishment of the battalion's seven basic tasks.

The FASP has been found by some of those who use it to be inadequate to ensure the timely and accurate delivery of required fires. In "The DS Artillery's Staff Planning Process--Adjustments for Success at the NTC," a 1992 Field Artillery article, LTC Albert F. Turner proposed that shortfalls in the staff planning process adversely affected the responsiveness of fires. His conclusion was that the staff planning process did not support the needs of the artillery due to timing challenges in the development of orders and due to inadequacies in the FA support plan. He proposed several modifications to the staff planning process to accelerate the FA battalion's ability to rapidly develop a FASP that supports the brigade plan. He found it advantageous to have the

DS battalion S-3 present at the brigade TOC when the brigade commander issued his guidance and to work out positioning issues with the brigade S-3 prior to returning to the battalion.[19] This simplified the challenge of being able to move and deliver fires in support of the brigade. Through a concerted effort on the part of the DS battalion staff, they prepared the FASP earlier than standard. While this entailed some risk by possibly getting out in front of the finalized brigade plan, it enabled his logistics system to make necessary preparations to arm, fuel, and fix in order to facilitate execution of the pending operation.

Ray D. Hendrickson, too, found in his 1992 thesis, Fire Support Planning Doctrine And The Decision Making Process, that there was a lack of connectivity between the fire support plan and the field artillery support plan. He specifically found that there was no clear method for the integration of the field artillery support plan with the fire support plan.[20] His findings coupled with those of Turner support the contention that those documents that drive how the artillery supports the maneuver commander's plan, do not adequately parallel the BCT's scheme of maneuver.

Wargaming

The "decisive terrain" for the synchronization of artillery fires is the mind of the supported maneuver commander. He generally first provides guidance to his staff after mission analysis as they prepare to develop several feasible, acceptable, and suitable courses of action (COAs). Ideally, the brigade FSO should be fully integrated into COA development. The substantive details of COA synchronization are developed and coordinated during wargaming. This event establishes the foundation for much of the preparation and execution that eventually follows. Reports from the NTC indicate that wargaming too often is not conducted with the participation of key leaders. Both "Fighting With Fires I" and "Fighting With Fires II" emphasize that wargaming is a primary method to work through staff friction. It is imperative that key leaders are present, adequately prepared, and actively participate in this process. (Within the DS artillery battalion, the key players include the FSCOORD, the Bde FSO, the battalion XO, S-3, and FDO.) A former senior

NTC OC suggests that the absence of the team skill of wargaming and the efficient capturing of its results is the principal cause of the mediocre performance pattern observed at the NTC.[21]

With the tremendous challenge and litany of tasks facing the FSCOORD and his principal assistants, they must take advantage of those few opportunities that they will have to try to synchronize and integrate the artillery battalion's efforts with those of the BCT. The processes and products involved in this are time- and resource-intensive. Perhaps the best opportunity that they will have is during wargaming, both at the brigade and in the DS battalion. Since maneuver brigades are hard-pressed to conduct an independent targeting meeting, the essentials of the D3A targeting process must be fleshed out during brigade wargaming. This makes it imperative that the artillery be represented by more than just the brigade FSO (and the FSCOORD when he attends).

If possible, the DS battalion S-3 or the Battalion FDO should attend the brigade wargame as well. While this may cause a temporary degradation in battalion operations or fire direction, the investment in their time should pay off significantly during execution of the fight. Obtaining first-hand knowledge of the development of the brigade COA would give key DS battalion leaders an appreciation for positioning, weapons delivery, target acquisition, and communications imperatives, in particular in the event of branch plan execution. Their attendance at the brigade wargame may not be feasible or cost-effective for every operation, but the FSCOORD may want to periodically require their attendance so that they may better understand how the brigade develops its high payoff targets, its attack guidance, and target selection standards, and to keep their heads directly in the brigade's fight. It is at this time (when the S-3 is forward at the brigade TOC) when the battalion XO should be at the DS battalion TOC to oversee the staff as it prepares to develop the FASP, in particular with regard to intelligence preparation of the battlefield (IPB) and staff estimates. This can be a key event with which the XO can start to synchronize logistical support to the plan.

NTC trends from 1994 and 1995 report that wargaming often occurs during the brigade combined arms rehearsal. This indicates that in addition to the improper conduct of rehearsals, the

wargaming performed earlier in the TDMP may not have been done well or thoroughly. It simply may be too late to resynchronize after the wargame (e.g., at the combined arms rehearsal) because subordinate commanders would already have taken a great deal of action in preparation to execute the original approved plan. The bottom line is that a heavy investment in the time of key players early in the decisionmaking process (at the brigade wargame) helps build synchronization and flexibility into the operation and ensures that all key players understand the capabilities and limitations of the artillery to support a particular plan. The sum of the efforts and resources involved in synchronizing the battalion's seven basic tasks is significant, but the product of these efforts exceeds the cost many times over if they contribute to fires being delivered at the time and place determined to be decisive by the BCT commander.

What Has Worked Well

There are a few key events in which leaders can make a marked contribution to the synchronization of fires and maneuver. It would therefore seem prudent for them to concentrate their efforts here in order to increase their chances for success. Those practices and TTPs that have been used by successful units are instructive.

"Training the Core Competencies," suggested that "wargaming is the most important step in synchronizing fire support," and that at the end of wargaming, units should have a fully-developed scheme of fires which is integrated into the maneuver plan.[22] It also stressed that advising the maneuver commander on fires capabilities and limitations is not a one-time event--"it's a dynamic process that matures as the staff wargames."[23]

Comments from a 1995 NTC THP also recommended using the battalion FDO more heavily in the orders process, as there currently is little emphasis on this in doctrine. He can brief the scheme of fires, volume of fires, shell-fuze combinations, fire unit assignment, triggers, and observers for each target. This is an example of a case where his involvement in the brigade wargame would clearly give him better insight into the operation. This same THP stressed that the

identification of task, purpose, method and endstate for HPTs greatly improves understanding and development of a scheme of fires, which has previously been identified as a shortcoming.

How To Improve and Close the Gap

In summary, when assessing the ends, ways, and means of artillery support, the ends (synchronization of fire with maneuver) are both reasonable and necessary; the means (fire support resources) are essentially adequate; the ways (the methods of applying these resources to achieve required objectives) remain very challenging. The artillery battalion must work relentlessly at its ability to coordinate fire support, acquire targets, deliver field artillery fires, communicate, move, maintain & resupply, and survive in order to effectively synchronize its actions in support the BCT.

There are multiple factors that cause artillery to be desynchronized from maneuver. Causes are found in the planning, preparation, and execution phases of operations. In some cases, plans are synchronized, but the operation gets desynchronized in preparation and execution. In other cases, planning is inadequate and the operation is destined to be desynchronized in spite of virtually any effort during preparation or execution. What is clear is that planning must be effective in order to have any reasonable expectation of successful execution. It appears that the key to synchronizing an operation is through thorough planning which builds in the necessary flexibility so that the artillery and maneuver can "resynchronize" as friction sets in and the situation changes. As a minimum, this planning should address those doctrinal considerations shown in Figure 5 and be validated and synchronized through the wargaming process. As one former OC remarked, "if synchronization is not produced in the planning process, there will be no evidence of it on the battlefield."[24]

The bottom line is that all actions, orders, processes, tasks, considerations, and principles must contribute to the supporter and the supported having a common picture in their minds' eye of what needs to occur and how the supporter needs to contribute--they must have a common

understanding of "purpose." The complexity of modern and emerging systems and procedures will likely make it increasingly difficult for the artillery battalion and the BCT to remain focused on those few events that will have a decisive effect on the outcome of a battle. Key leaders cannot allow themselves to become so encumbered by the processes that they lose their freedom to think through the most important aspects of the operation. Leaders can and must make the system (battle-staffs, TDMP tools, orders, doctrine, and TTPs) serve them so that they can synchronize effects of artillery fire in support of the BCT battle plan. Commanders must ensure that they set the conditions in their staff planning and decisionmaking processes that permit the art to rise above the science.

Endnotes

[1]U.S. Army, "The Battalion and Brigade Battlestaff," CALL Newsletter 93-3 (Ft. Leavenworth, KS: U.S. Army Combined Arms Command, 1993), 7.

[2]Warren Bennis and Burt Nanus, Leaders, The Strategies For Taking Charge (New York: Harper and Row, 1985), 5.

[3]United States Marine Corps, FMFM 1, Warfighting (Washington, DC: Government Printing Office), 59.

[4]FM 100-5, 2-8.

[5]Ibid.

[6]Antoine Henri Jomini, "Summary of the Art of War," in Roots of Strategy, Book 2 (Harrisburg, PA: Stackpole, 1987), 461.

[7]Ibid.

[8]FM 100-5, 2-4.

[9]Ibid.

[10]Ibid.

[11]Ibid., 2-9.

[12]Ibid., 2-10.

[13]Was de Czege and Cuff, 48.

[14]FM 100-5, 2-13.

[15]United States Army Command and General Staff College, Brigade Commander's TCDC Advance Book (Fort Leavenworth, KS: United States Army Command and General Staff College, 31 October 1995), 28.

[16]Samuel R. White, Jr., "Development of the Brigade Scheme of Fire Support," in Fighting with Fires II, July 95, 25.

[17]Ibid.

[18]FM 6-20, 3-10.

[19]LTC Albert F. Turner, "The DS Artillery's Staff Planning Process -- Adjustments for Success at the NTC," Field Artillery, October, 1992.

[20]Hendrickson, 19.

[21]Rosenberger, I-9.

[22]Baxter, Dunn, Hayes, Palmer, 9.

[23]Ibid., 9.

[24]Rosenberger, I-7.

CHAPTER 6

THE TRAINING CHALLENGE OF SYNCHRONIZING ARTILLERY FIRES

> The teams and staffs through which the modern commander absorbs information and exercises his authority must be a beautifully interlocked, smooth-working mechanism. Ideally, the whole should be practically a single mind.[1]
>
> General of the Army Dwight D. Eisenhower, Crusade in Europe

Having confirmed that artillery support to the brigade is difficult, even under ideal conditions, it is useful to analyze how successful units train to meet this challenge. The doctrinal tools and procedures that are employed to synchronize fires with maneuver are resource intensive, in particular with regard to the time and effort of key leaders. In spite of some of the shortfalls mentioned in the previous chapter, the doctrine for artillery support to the BCT is sound; however, the demands of executing this doctrine make it essential for the BCT to maximize its training effectiveness in order to better synchronize artillery fires with maneuver. Key areas for improvement of artillery synchronization within the TDMP are the battle staff skills of wargaming and the development of the fire support and field artillery support plans. The improvement of these skills through training can result in a more effective battle staff and a corresponding improvement in the synchronization of fires and maneuver in support of the BCT.

This chapter highlights training considerations for units necessitated by the challenges of implementing the doctrine described earlier in this thesis. It also discusses how resource limitations and personnel turbulence impact upon this training. In this era of diminishing resources, U.S. Army units need to train effectively and efficiently in order to derive the maximum training benefit from every opportunity. The NTC is the premier facility in the world with which mechanized units

can realistically train on their wartime missions. While the NTC rotation is the capstone event in a unit's training cycle, the pre-rotation training program that units undergo at home-station can provide significant training benefits as well. An emphasis on pre-NTC home station training can be instrumental in the improvement of training doctrine implementation in the force. By thoroughly integrating the guidelines established in FM 25-100, Training the Force, and FM 25-101, Battle Focused Training, into their home station training programs, units can optimize the training value of the NTC and have a "successful" rotation. This chapter examines how some units have implemented this guidance to execute effective training that contributed to a successful rotation in spite of the aforementioned challenges.

Training Doctrine

FM 25-100, Training the Force, establishes the Army's standardized training doctrine. It provides the guidelines on how to plan, execute, and assess training at all levels, however it is primarily focused on battalion-sized units and higher. It establishes the U.S. Army's principles of training: train as combined arms and services team, train as you fight, use appropriate doctrine, use performance oriented training, train to challenge, train to sustain proficiency, train using multiechelon techniques, train to maintain, make commanders the primary trainers; and discusses how they relate to well-trained, combat ready units.[2] This chapter will discuss how successful units use these principles at home-station in preparation for an NTC rotation.

FM 25-101, Battle Focused Training, applies the training doctrine established in FM 25-100 and assists leaders at battalion-level and below in the development and execution of their training programs. Of relevance to this thesis is its discussion on the use of major training events such as combat training center rotations to maintain battle focus. It provides an overview of the CTC program, offers recommended solutions to problems frequently observed at the CTCs, offers specific training considerations by BOS, and discusses the CTC training management interface.[3] Among the recommendations it provides to improve fire support are for units to "train, rehearse

and practice TACSOP," and to "wargame the fire support plan." It offers no amplification on these points but they are consistent with capstone doctrine (FM 100-5), the principles of training (train as you fight), and NTC observations ("Fighting With Fires").

Assessment of Training Doctrine

High-performing units adhere to the training principles in FM 25-100 and FM 25-101 throughout the four phases of the training management cycle (METL development, planning, execution, and assessment).[4] In 1994, the U.S. Army Research Institute for the Behavioral and Social Sciences published Determinants of Effective Unit Performance, which employed a variety of techniques to measure and understand unit collective performance both at home stations and at CTCs. The authors conducted an in-depth investigation of seven NTC rotations including units' application of the FM 25-100 training management cycle and their application of training principles. They also identified training and personnel factors that distinguished high performing units from others.[5] The authors found that the most successful units did not stand out from the others in any particular area but in the fact that, across the board, their training was more in keeping with the principles of training established in FM 25-100. This suggested that "there is no one thing that a unit can do that will by itself guarantee the effectiveness of its training. Instead, a disciplined application of the principles is necessary to ensure the successful preparation of the unit for combat."[6]

This research team also proposed some key recommendations for optimal home station training:[7]

1. Emphasize combined arms tasks in classroom and field training.
2. Ensure that a battle task focus is established in unit training plans, particularly by basing unit METL on explicitly identified MTP tasks.
3. Ensure that training schedules and the pace of training consider skill decay and sustainment.

4. Ensure that training emphasizes the integration of the battle staff and the use of a battle staff SOP.
5. Establish standards for all tasks.

This study did a service to Army trainers since it empirically validated the training principles in FM 25-100.[8] An appreciation for this can be a significant step toward the collective improvement of training doctrine implementation in the field.

Training Challenges

Resource and Personnel Challenges

In addition to the challenge presented by the highly-trained OPFOR and the taxing conditions at the NTC, units also have significant obstacles to contend with during their preparation for a rotation to the NTC. Units often experience large-scale personnel turnover between rotations and arrive at the NTC with a "new team." This personnel turbulence coupled with the demands of making the resource-intensive artillery support system work can present a formidable problem to the BCT. It is therefore imperative that units be able to rapidly build teams that can efficiently operate together, in particular regarding their battle staffs.

Units expend significant energy and resources in preparation for a rotation to the NTC. To be successful at the NTC, units must perform their METL tasks to MTP standards.[9] Since the NTC comes closer to replicating combat conditions for the BCT than any other training vehicle, a unit preparing for a rotation is also preparing for combat. This justifies the significant energy expended in the ongoing efforts to improve unit performance at the NTC.

Units usually arrive at the NTC at a less than optimal level of collective training proficiency due in large part to resource constraints on home station training. Often, they have been provided minimal opportunities to conduct full-scale BCT collective training that fully taxes the components of each BOS. Although units generally make a significant improvement by the end of the rotation, they would have been better served had they arrived at the rotation at a higher state

of training, somewhere in the "band of excellence."[10] This would ensure that the unit was sufficiently proficient in its METL tasks to benefit to the maximum possible degree from the NTC experience.

Doctrinal Challenges

Artillery support doctrine and associated TTPs present trainers with several important battle staff training issues. The TDMP provides several opportunities in which the commander and his staff may improve synchronization of available combat power. Wargaming is one of these critical opportunities. As previously stated, effective wargaming of artillery support to the BCT involves the active consideration of the seven basic artillery battalion tasks, fire support planning and coordination principles, and other considerations to provide adequate, flexible, and continuous support (close support, counterfire, and SEAD) throughout the entire battlefield framework to synchronize the BCT's artillery fires using the D3A methodology (figure 5).

Training on Critical TDMP Areas

Wargaming Shortfalls

A deficiency in units' performance of the TDMP that causes many of the shortcomings observed during execution is inadequate wargaming. Several former senior OCs emphasize the significance of this, because "wargaming is the most important step in synchronizing fire support," and that at the end of wargaming, units should have a fully-developed scheme of fires which is integrated into the maneuver plan.[11] This suggests that a unit significantly increases its potential of desynchronizing its fires with maneuver should it not adequately wargame its course of action.

Reports from the NTC indicate that wargaming too often is not conducted with the participation of key leaders. Both "Fighting With Fires I" and "Fighting With Fires II" emphasize that wargaming is a primary method to work through staff friction. It is imperative that key leaders are present, adequately prepared, and actively participate in this process. (Within the DS artillery battalion, the key players include the FSCOORD, the Bde FSO, the battalion XO, S-3,

and FDO.) A former senior NTC OC suggests that the absence of the team skill of wargaming and the efficient capturing of its results is the principal cause of the mediocre performance pattern observed at the NTC.[12]

NTC trends from 1994 and 1995 report that wargaming often occurs during the brigade combined arms rehearsal. This indicates that in addition to the improper conduct of rehearsals, the wargaming performed earlier in the TDMP may not have been done well or thoroughly. It simply may be too late to resynchronize after the wargame (e.g., at the combined arms rehearsal) because subordinate commanders would already have taken a great deal of action in preparation to execute the original approved plan. The bottom line is that a heavy investment in the time of key players early in the decisionmaking process (at the brigade wargame) helps build synchronization and flexibility into the operation and ensures that all key players understand the capabilities and limitations of the artillery to support a particular plan.

Training Solutions to Wargaming Shortfalls

The brigade staff needs to be trained on its wargaming skills. Wargaming is essentially a collective battle drill for the brigade staff and should be conducted thoroughly but rapidly. This ensures that critical events are analyzed by BOS experts who can provide their input to the brigade plan. BOS representatives, in this case the brigade FSO (and optimally, the DS battalion S-3 as well), must be thoroughly familiar with the capabilities and limitations of their BOS and be able to clearly articulate this knowledge during the wargame. As stressed in "Training the Core Competencies," advising the maneuver commander on fires capabilities and limitations is not a one-time event--"it's a dynamic process that matures as the staff wargames."[13] Training on wargaming skills needs to emphasize that the resulting lessons and issues from the wargame should be thoroughly captured and disseminated. This should be a METL task for the brigade staff.

The brigade battle staff needs to address the issues contained in a "targeting meeting" during its TDMP. Specifically, it should address the complete "decide-detect-deliver-assess"

(D3A) targeting methodology. Ideally, this would be conducted after the wargame with all key players, but in a time-constrained environment, should occur during the wargame. This is essential in order to synchronize the employment of the BCT's "sensing and shooting" assets in support of its plan. This also should be part of the brigade staff METL.

The BCT commander should develop a battle staff training program that ensures that his battle staff can consistently wargame a course of action to standard. In a time constrained environment, the staff should be able to focus on those key events essential to success of the overall mission. This training program could be patterned after a "crawl, walk, run" focus starting with chalk talks and progressing through CPXs to full up field exercises. Methods to impart this include officer professional development (OPD) with the brigade staff, battle staff training which stresses the wargaming of COAs strictly in accordance with doctrine and approved TTPs, and staff CPXs to reinforce this training. Several CALL products provide a good starting point for this training, specifically, "The Brigade and Battalion Battle Staff," "Tactical Decision Making," and "Tactical Operation Center (TOC)" handbooks. The bottom line is that the commander must ensure that his battle staff can address and accurately capture the essential details of the battle during wargaming in order to fully synchronize the effects of his available combat power.

Proven Techniques

Identification of strategies and training techniques of successful units is instructive. This not only provides lessons to be used by the field at large, but also provides a benchmark with which to validate or refute the doctrinal correctness of their training strategies. Those solutions that have been found to be effective by some units at the NTC may be useful as units plan home station training to increase their probability of rotation success.

Development of the Fire Support and Field Artillery Support Plans

Improvement of artillery synchronization with maneuver can be attained through battle staff training on fire support and field artillery support plan development. In recognition of the time constraints present during the planning phase of most tactical operations, many successful units have used parallel planning between the brigade and DS battalion TOCs to provide the DS battalion with the time necessary to make those adjustments necessary to adequately prepare to execute its seven basic tasks. The improvement of these staff skills through training can result in a more effective battle staff and a corresponding improvement in the synchronization of fires and maneuver in support of the BCT.

In addition to modifying some steps in the staff planning process (because of its shortcomings in supporting the needs of the artillery due to timing challenges in the development of orders and also due to inadequacies in the FASP), LTC Albert F. Turner trained his DS battalion staff to prepare the FASP earlier than standard, as reported in "The DS Artillery's Staff Planning Process--Adjustments for Success at the NTC." Turner proposed that responsiveness of fires could be improved through modifications to the staff planning process and by training the DS battalion staff to accelerate its ability to develop a FASP that supports the brigade plan.[14] His solution to this challenge reflects his recognition of the fact that moderate emphasis on streamlining staff operations can have a significant positive impact on mission execution. It also reflects his appreciation for the non-renewable resource of time that is always in such short supply during the planning phase of a tactical operation. As Napoleon is said to have remarked, "You can ask me for anything you like, except time."[15]

Battle staff issues

Improvements in battle staff operations (for both the BCT and the field artillery battalion) can result in a demonstrable improvement in artillery support because an effective battle staff can be a significant combat multiplier. The bottom line here is that staff teamwork is not only

desirable but essential. Commanders need to leverage the training value of each event, and the relatively low cost (with the exception of key leaders' time) of training the staff can result in high payoff on the battlefield (or at the NTC); likewise, there may be a high risk if they do not invest in this relatively low cost training. (An example of this is a unit using the TDMP whenever possible for garrison activities. While the full TDMP may not always be required, requiring the staff to conduct mission analysis, estimates, and wargaming for upcoming events will clearly reinforce both the process and the utility of the TDMP and train the staff to operate as it must fight.) Otherwise, staffs and leaders may get so bogged down in the mechanics of coordination that little energy or time remains for the creative and artistic application of these processes to attain their intended purpose.

Commanders must not only train their units as they intend them to fight, but their staffs as well. In "Training the Core Competencies," Baxter, Dunn, Hayes, and Palmer stressed that "units must validate that their core competencies are trained to standard under CTC-like conditions before crossing the line-of-departure at the CTCs."[16] They also suggested that "commanders should use their most complex mission essential tasks--the *ones requiring the most training and coordination with the combined arms staff* [emphasis added]--as vehicles to train FSE leaders' core competencies."[17] Their recommendations fully support the principles of training, particularly "train as combined arms and services team," "train as you fight," "use appropriate doctrine," "train to challenge," and "train using multiechelon techniques."

Staff Coordination and Efficiency

Staff efficiency is not a doctrinal problem; it is a training and teamwork problem. Many NTC observations report that units continue to be challenged with staff coordination, certainly not a new trend for units conducting tactical operations, but an important one nonetheless. This problem is not unique to field artillery units but applies to myriad organizations. Staff

inefficiencies, where they exist, are not the result of doctrinal inconsistencies; they are often the result of training shortfalls and the lack of teamwork within the staff.

Staff training deficiencies that result in poor coordination or less than thorough and timely planning can adversely impact on the battalion's time and resource intensive preparations to execute its mission. These preparations include the coordination of fire support, the repositioning of target acquisition and delivery assets, synchronization of movement, positioning, and terrain management, communications support (retransmission requirements for COLTs), resupply and redistribution of special ammunition, and steps necessary to enhance the units' survival prospects. Shortfalls in these preparations can directly impact on the artillery battalion's ability to execute one or more of its seven basic tasks. Any significant shortcoming in an artillery battalion's ability to execute its basic tasks can result in a degradation in its ability to deliver fires when and where required, and directly and adversely effect the ability of the FSCOORD to ensure that his fires are synchronized with maneuver.

TACSOPS

In accordance with FM 25-100, units need to train as they fight. In order to consistently train as they intend to fight, units must have standardized tactical standard operating procedures (TACSOPs). Furthermore, the TACSOP must be field tested and understood by the entire unit. Once this is accomplished, the TACSOP can serve as the "playbook" from which leaders can call audibles as the situation dictates. In "Fighting with Fires" and "Fighting with Fires II," LTC Michael T. Hayes, the Senior Fire Support Combat Trainer at NTC in 1995, reported that this was critical to successful mission accomplishment at the NTC, yet not consistently seen in rotating units. He emphasized that units must possess TACSOPs which everyone understands and routinely uses. [18] Each unit must have a detailed TACSOP describing the actions or battle drills required for the unit to accomplish a task or mission and must follow this TACSOP during all home-station training events.

There are multiple factors that cause artillery to be desynchronized from maneuver. Causes are found in the planning, preparation, and execution phases of operations. In some cases, plans are synchronized, but the operation gets desynchronized in preparation and execution. In other cases, planning is inadequate and the operation is destined to be desynchronized in spite of virtually any effort during preparation or execution. What is clear is that planning must be both thorough and timely in order to have any reasonable expectation of successful execution. It appears that the key to synchronizing an operation is through thorough planning which builds in the necessary flexibility so that the artillery and maneuver can "resynchronize" as friction sets in and the situation changes.

Timely and thorough planning does not just happen. Commanders must train their battle staffs to consistently execute this staff METL task to standard. They must understand the difficulties that they will face, both due to resource constraints and due to the challenges imposed by the doctrine itself, and take every available opportunity to train to overcome them. They can drill their staffs on those TDMP steps so critical to synchronization of fires with maneuver such as wargaming, fire support plan and FASP development, and basic staff coordination procedures. They can facilitate their unit's effectiveness and efficiency in these staff drills through the use of well understood TACSOPS that are continually reinforced and practiced during home station training and enable the staff to train as it intends to fight.

While the NTC rotation is often the "graduation exercise" in a unit's training cycle, the pre-rotation training program that the unit undergoes at home-station can result in equally significant benefits. By thoroughly integrating the principles established in FM 25-100 and FM 25-101 into their home station training programs, units can optimize the training value of the NTC and have a "successful" rotation. This chapter highlighted how some units have implemented this guidance to execute effective training that contributed to a successful rotation in spite of significant resource challenges. This emphasis on pre-NTC home station training can be instrumental in the improvement of training doctrine implementation in the force. What this confirms is that

challenging, realistic, and imaginative training strategies focused toward attaining the goal of effective artillery support are key to ensuring that it is consistently attained. Furthermore, this underscores the fact that is that any insights gained from this training will only be of lasting benefit if its lessons (either learned or simply reemphasized), are accounted for and systematically incorporated into units' home station training programs so that they may realistically "train as they fight."

Endnotes

[1]Dwight D. Eisenhower, Crusade in Europe, (New York: Doubleday, 1948), 75.

[2]U.S. Department of the Army, FM 25-100, Training the Force (Washington, DC: Government Printing Office, 1988), i-iv.

[3]FM 25-101, i-iii, Appendix D.

[4]Ibid., 1-11.

[5]Robert F. Holz, Jack H. Hiller, Howard H. McFann, Determinants of Effective Unit Performance. (Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences, 1994), ix.

[6]Robert F. Holz, Francis O'Mara, and Ward Keesling, "Determinants of Effective Unit Performance at the National Training Center: Project Overview," Ibid., 91.

[7]Ibid., 96.

[8]Ibid.

[9]Ibid., D-2.

[10]FM 25-100, 1-4.

[11]Baxter, Dunn, Hayes, Palmer, 9.

[12]Rosenberger, I-9.

[13]Ibid.

[14]Turner.

[15]"The Battalion and Brigade Battle Staff," 9.

[16]Baxter, Dunn, Hayes, Palmer, 8.

[17]Ibid.

[18]U.S. Army, "Fighting with Fires," CALL Newsletter 95-6, May, 1995, and "Fighting with Fires II," CALL Newsletter 95-10, July, 1995.

CHAPTER 7

CONCLUSIONS AND RECOMMENDATIONS

> The effective functioning of the infantry-artillery team depends upon the intelligent and unremitting efforts of both members to solve the difficult problem of liaison.[1]
>
> Infantry in Battle

Conclusions

First of all, field artillery support is difficult business. The doctrinal processes that are employed are resource intensive, in particular with respect to the time and effort of key leaders. In spite of some shortfalls, the doctrine for artillery support to the BCT is sound; however, the demands of executing this doctrine make it essential for the BCT to maximize its training effectiveness in order to better synchronize artillery fires with maneuver. Key areas for improvement of artillery synchronization within the TDMP are the battle staff skills of wargaming and the development of the fire support and field artillery support plans. The improvement of these skills through training can result in a more effective battle staff and a corresponding improvement in the synchronization of fires and maneuver in support of the BCT.

Rather than relying upon proposed changes to doctrine, units primarily need to become more proficient at operating in accordance with this doctrine. This is far easier said than done. Improvements in training that would contribute to the improvement execution appear to be both warranted and feasible. As Clausewitz said however, "In war everything is simple, but even the simplest thing is difficult." Neither the maneuver nor fire support communities can simply step back, wash their hands, and direct units to "do better" without providing some assistance.

The challenge to the BCT commander and his FSCOORD is to visualize the ends needed to be successful (synchronization of artillery fires with maneuver at the decisive time and place), make best use of the means available to accomplish the mission (field artillery system resources), and determine the most effective and efficient ways of applying those resources to achieve the desired endstate. Some TTPs need refinement in order to simplify the execution of artillery support, but this mission will remain a significant challenge nonetheless. A key point is that doctrine (and TTPs) should serve to facilitate accomplishment of the mission, not be an encumbrance to it. A challenge facing artillery and maneuver communities alike is that with the increasing complexity and volume of information required to "make the system work," soldiers and leaders risk becoming subservient to the system rather than having the system support them.

Having read this analysis, how can one use it to improve his unit's capability to consistently and effectively support the BCT? This is the ultimate test of the utility of this study. No new "truths" or "principles" regarding field artillery support to the BCT were discovered; perhaps this may not even be possible. What was confirmed and reemphasized are two factors regarding this issue. First, leaders can and must make the system (battle-staffs, the TDMP--especially wargaming and development of fire support and field artillery support plans) serve them so that they can synchronize the effects of artillery fire in support of the battle plan. Second, that challenging, realistic, and imaginative training strategies planned, executed, and assessed in accordance with the training principles established in FM 25-100 focused toward attaining the goal of synchronized artillery support are key to ensuring that it is consistently attained. Amid the massive literature on this subject, the most significant contribution of this thesis may be its reemphasis on fundamental doctrine, training, and TTPs that have already been demonstrated to work.

Maneuver-Fire Support Interface

The apparent lack of recognition of the relationship between firepower and maneuver evident in the tactical orders process requires resolution. The separate paragraphs in the five paragraph OPORD addressing the scheme of maneuver (3.a.(1)) and fires (3.a.(2)) may contribute to the breakdown between the "inseparable" elements of fire and maneuver. This investigation has not revealed empirical evidence to demonstrate that a revision of the OPORD format would improve synchronization of fires and maneuver; however, it is reasonable to postulate that either our fundamental doctrine, "maneuver and firepower are inseparable," or our fundamental tool for conducting tactical operations, the five paragraph OPORD, are inconsistent. This issue may appear subtle on the surface, but is potentially quite significant. Should the basic OPORD format contribute to a separation of firepower and maneuver in the minds of its users, then their ability to synergistically employ the effects of fires and maneuver at the decisive time and place may be limited.

There is a need for a "how to fight" the artillery doctrine that parallels or complements the maneuver how to fight manuals. The separate pieces of field artillery support viewed from the cannon battalion's perspective are described in FM 6-20-1, however; it is partially left up to the artillery to integrate itself with the maneuver. FM 71-123 and FM 6-20-40 provide a starting point; however, more can be done for artillery specific doctrine and TTPs. The benefit of codifying "how to fight" artillery doctrine (and TTPs) is that its very development would force its practitioners toward a more complete synthesis of its many elements into a single cohesive framework. This should ultimately enhance the synchronization of fires with maneuver.

There are multiple factors that contribute the desynchronization of fires and maneuver in the BCT. Causes can be found in the planning, preparation, and execution phases of an operation. What is evident is, that in order to have any reasonable expectation of successful execution, an operation's planning phase must focus in sufficient detail on the operation's critical events and do so in a timely manner. The key to synchronizing an operation is through thorough planning which

builds in the flexibility necessary for the artillery and maneuver to be able to "resynchronize" as friction sets in and the situation changes. As a minimum, this planning should address the basic doctrinal considerations of fire support planning and coordination and the seven tasks of the artillery battalion. Additionally, this detailed planning must be validated and synchronized through the wargaming process.

The bottom line is that all actions, orders, processes, tasks, considerations, and principles must contribute to the supporter and the supported having a common vision of what the supporter needs to contribute in order for the BCT to achieve its purpose. The complexity of modern and emerging systems and procedures may make it increasingly difficult for the artillery battalion and the BCT to remain focused on those few events that will have a decisive effect on the outcome of a battle. Leaders cannot allow themselves to become so encumbered by the processes that they lose their freedom to think through the most important aspects of the operation. Leaders can and must make the system (battle-staffs, TDMP tools, orders, doctrine, and TTPs) serve them so that they can synchronize the effects of artillery fire in support of the BCT battle plan. Commanders need to set the conditions in their staff planning and decisionmaking processes that permit them to rise above the science of artillery support and to practice the art.

Training

Challenging, realistic, and imaginative training strategies focused toward attaining the goal of effective artillery support are key to ensuring that it is consistently attained. Those units whose training reflects a consistently disciplined application of the principles of training established in FM 25-100 are more likely to be successful in pursuit of this goal.

Battlestaff Issues

Improvements in battle-staff operations (for both the BCT and the field artillery battalion) can result in a demonstrable improvement in artillery support because an effective battlestaff can be a significant combat multiplier. The bottom line here is that staff teamwork is not only

desirable but essential. Commanders need to leverage the training value of each event, and the relatively low cost (with the exception of key leaders' time) of training the staff can result in high payoff on the battlefield (or at the NTC); likewise, there may be a high risk if they do not invest in this relatively low cost training. Otherwise, staffs and leaders may get so bogged down in the mechanics of coordination that little energy or time remains for the creative and artistic application of these processes to attain their intended purpose. Emphasis on the artillery battalion XO as the second in command, and the TTP of positioning the XO at the battalion TOC when the S-3 is at the brigade wargame, would help alleviate this issue in the DS battalion.

Wargaming

A deficiency in units' performance of the TDMP that causes many of the shortcomings observed during execution is inadequate wargaming. Wargaming is a critical step in synchronizing fire support. It is imperative that key leaders are present, adequately prepared, and actively participate in the wargaming process to work through the essential details of a course of action. If, at the conclusion of wargaming, a fully-developed scheme of fires is not integrated into the maneuver plan, then there is risk that the BCT will not be able to optimize the use of its available combat power at the decisive time and place.[2]

A unit significantly increases its potential of desynchronizing its fires with maneuver should it not adequately wargame its course of action. It may be too late to resynchronize after the wargame. The bottom line is that a heavy investment in the time of key players early in the decisionmaking process (at the brigade wargame) helps build synchronization and flexibility into the operation and ensures that all key players understand the capabilities and limitations of the artillery to support a particular plan.

The brigade staff needs to be trained on its wargaming skills. Wargaming is a collective battle drill for the brigade staff and should be conducted thoroughly and rapidly. This ensures that critical events are analyzed by BOS experts who can provide their input to the brigade plan. BOS

representatives, in this case the brigade FSO (and optimally, the DS battalion S-3 as well), must be thoroughly familiar with the capabilities and limitations of their BOS and be able to clearly articulate this knowledge during the wargame. Additionally, training on wargaming skills needs to emphasize that the resulting lessons and issues from the wargame should be thoroughly captured and disseminated. This should be a METL task for the brigade staff.

The brigade battle staff needs to address the issues contained in a "targeting meeting" during its TDMP. Specifically, it should address the complete "decide-detect-deliver-assess" (D3A) targeting methodology. Ideally, this would be conducted after the wargame with all key players, but in a time-constrained environment, should occur during the wargame. This is essential in order to synchronize the employment of the BCT's "sensing and shooting" assets in support of its plan. This also should be part of the brigade staff METL.

The BCT commander should have a battle staff training program that ensures that his battle staff can consistently wargame a course of action to standard. In a time constrained environment, the staff should be able to focus on those key events essential to success of the overall mission. This training program could be patterned after a "crawl, walk, run" focus starting with chalk talks and progressing through CPXs to full up field exercises. Methods to impart this include officer professional development (OPD) with the brigade staff, battle staff training which stresses the wargaming of COAs strictly in accordance with doctrine and approved TTPs, and staff CPXs to reinforce this training. Several CALL products provide a good starting point for this training, specifically, "The Brigade and Battalion Battle Staff," "Tactical Decision Making," and "Tactical Operation Center (TOC)" handbooks. The bottom line is that the commander must ensure that his battle staff can address and accurately capture the essential details of the battle during wargaming in order to fully synchronize the effects of his available combat power.

NTC-Peculiar Issues

Suppression may be the biggest contribution of fire support in battle but the NTC does not replicate this effect; therefore, the only "Go" is a mission in which some physical destruction of the target is involved. Artillery fires at the NTC simply cannot be given "proper credit" for the contribution that they would make on the battlefield due to the unavoidable sterility of this environment. This should not change the way units fight at the NTC, but this point needs to be reinforced by both OCs and unit leaders to ensure that units do not leave the NTC with a false impression of the capabilities and limitations of artillery.

"Success" can be attained in at least two major areas for an NTC rotation. Units may be successful in achieving desired physical effects (short of suppression) with their fires; they may also attain success in training, marked by progressive improvement throughout the rotation. Although this investigation did not reveal evidence of this phenomenon, readers must appreciate the risk in extrapolating lessons from units that try to "win the game" at NTC as opposed to preparing to succeed on the battlefield where the score is kept differently.

Issues for Further Study

This investigation has identified several issues that merit further examination in order to improve artillery support to the BCT. Potential research questions include: What will be the specific impact of Paladin or AFATDS on FA and fire support systems? Can formalized training for the battalion S-3 and brigade FSO fill a void in current institutional training? What organizational, materiel, and leadership issues (the other elements of DTOML) impact upon this area? Can suppressive effects be better incorporated into an NTC rotation?

Looking Ahead

For this, or any study on this subject, to have any lasting value, it should be structured so as to facilitate its integration with future developments. With the pending significant changes in artillery capabilities with the fielding of twenty-first century systems such as Paladin, AFATDS,

Crusader, and other developments, this is particularly important. What is certain is that any technological advantage that the U.S. artillery will achieve will not remain dominant for long. For example, it is projected that by the year 2000, approximately 40 countries will have artillery systems that outrange Paladin.[3] Distinguished military author Martin Van Creveld offers some cogent considerations regarding this issue in Command In War. He cautions that:

> Any given technology has very strict limits. Often the critical factor is less the type of hardware available than the way it is put to use. Specifically, since a decisive technological advantage is a fairly rare and always temporary phenomenon, victory often depends not so much on having superior technology at hand as on understanding the limits of any given technology, and on finding a way in going around those limitations . . . dependence on technology inevitably creates vulnerabilities that an intelligent enemy will not be slow to exploit.[4]

What this thesis has proposed is not dependence on a technological fix, but on finding ways in going around inherent limitations to ensure the highest possible degree of synchronization of fires with maneuver. Leaders visualize synchronization of fires and maneuver and put systems into motion in order to achieve it. Soldiers make synchronization happen, with the *assistance* of the tools and technology at their disposal.

Recommendations

In order to make use of this examination, one must determine how best to relate its conclusions, some relatively direct and pragmatic, others potentially esoteric in nature, into actions that may improve artillery support to the BCT. Can leaders use its conclusions to improve their units' effectiveness? They can if two considerations are understood. First, that a better understanding of the artillery support challenge is the first step toward its resolution, and second, that any deduced knowledge or insights will only be of lasting benefit if its lessons, either learned or simply reemphasized, are accounted for and systematically incorporated into units' home station training programs.

Revise the OPORD Format

The OPORD format should be examined to determine if a revision in its format could improve synchronization of fires and maneuver by resolving the inconsistency between the "inseparability" of maneuver and firepower and the separate maneuver and fires sections in our fundamental tool for conveying tactical orders. A potential "fix" for this could be a combined "fire and maneuver" paragraph in lieu of the current distinct paragraphs for each.

Maximize the Benefit from Wargaming

Quite simply, the more time and effort that the BCT puts into synchronizing its artillery support through wargaming, the greater the payoff. When possible, the DS battalion S-3 should attend the brigade wargame. While this may cause a temporary degradation in operational effectiveness, the investment in his time should pay off significantly during execution of the fight. Obtaining first-hand knowledge of the essence of the brigade COA gives the leader who "fights the artillery battalion," the S-3, an appreciation for positioning, weapons delivery, target acquisition, and communications imperatives of the pending mission. Recognizing that his attendance at the brigade wargame may not be feasible or cost-effective for every operation, the FSCOORD may want to periodically require his attendance so that he may better understand how the brigade fights and what it requires from its artillery. It is at this time (when the S-3 is forward at the brigade TOC) when the battalion XO should be at the DS battalion TOC to oversee the staff as it prepares to develop the FASP, in particular with regard to intelligence preparation of the battlefield (IPB) and staff estimates. This can be a key event with which the XO can start to synchronize logistical support to the plan.

Train the Staff on the TDMP Whenever Possible.

Leaders must train the TDMP both in the field and in garrison. While the full TDMP may not always be required, requiring the staff to conduct mission analysis, estimates, and wargaming for upcoming events will clearly reinforce both the process and the utility of the TDMP and train

the staff to operate as it must fight. Development and utilization of TACSOPs is essential for this to be done efficiently and effectively. TACSOPS must be field tested and understood by the entire unit. Once this is accomplished, they can serve as the battalion "playbook" from which leaders can call audibles as the situation dictates and maintain the flexibility required to respond to the unexpected and be able to rapidly resynchronize combat power.

Final Thoughts

In order to deal with the challenges of high OPTEMPO and personnel turbulence that can mitigate a field artillery battalion's ability to provide effective support to the BCT, its leaders must remain fully cognizant of their changing capabilities and limitations. Regarding the challenges imposed by doctrine, leaders must build flexibility into their planning process early. Wargaming appears to be an opportune place within the TDMP to accomplish this. The thought processes which must be articulated during wargaming convey to all participants the essence of the decisive components of the pending operation. This realization of the essence of the operation and a common understanding of purpose with the BCT commander will contribute to the development of feasible and flexible plans that can deal with unexpected changes that inevitably occur during the fog and friction of execution. Effective combat leaders understand von Moltke's dictum that "no plan survives contact with the enemy," and train their staffs and subordinate units to plan, prepare, and execute accordingly.

Endnotes

[1]Infantry in Battle, (Washington, DC, 1939), 250.

[2]Baxter, Dunn, Hayes, Palmer, 9.

[3]Stephen Lopez and Fred Coppola, "Crusader: Force XXI's Top Gun," in Military Review, November-December 1995, 64.

[4]Martin Van Creveld, Command In War (Cambridge: Harvard University Press), 231.

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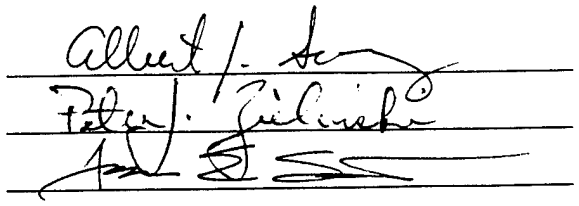

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